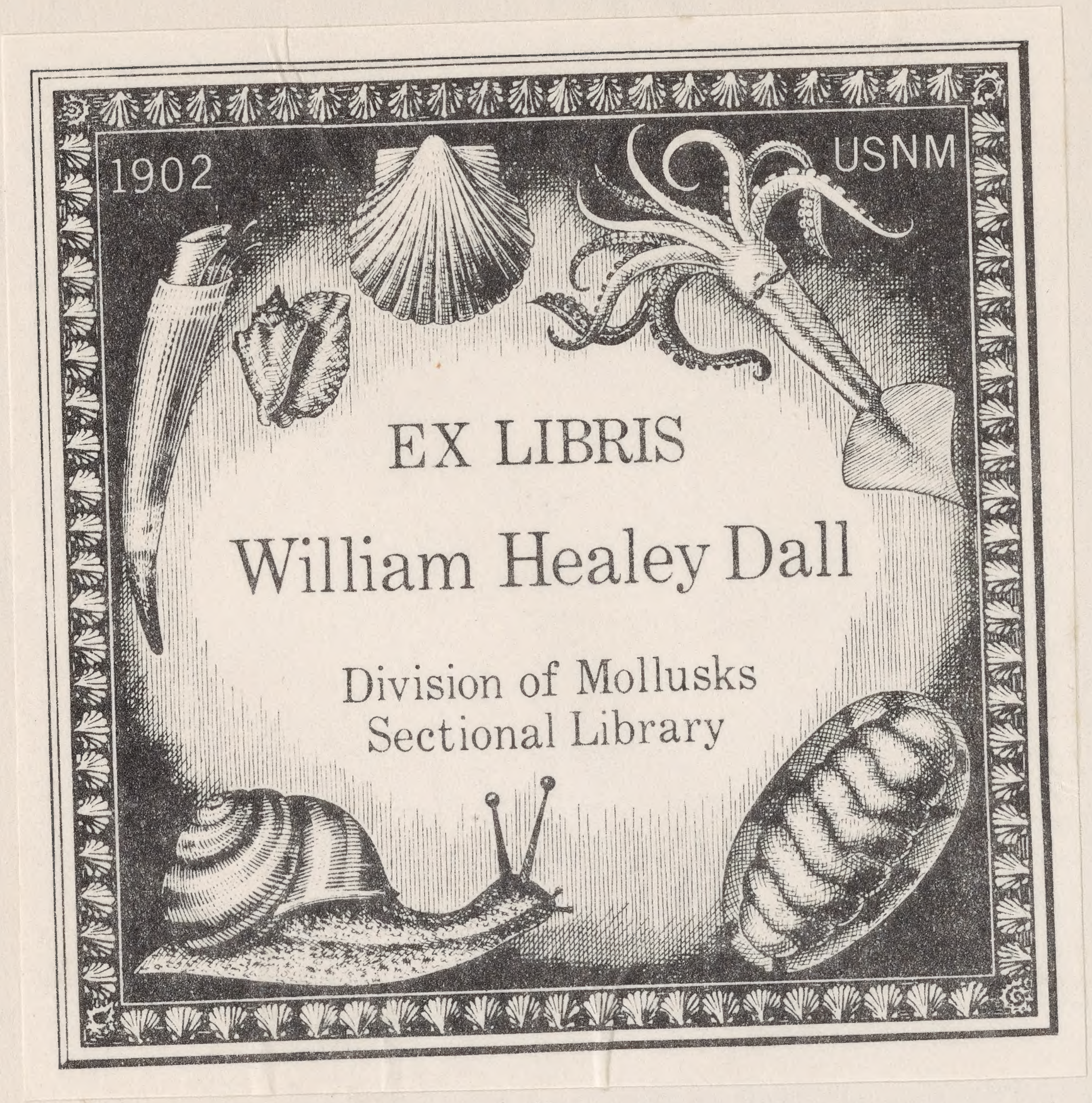


1902 USNM

EX LIBRIS
William Healey Dall
Division of Mollusks
Sectional Library

H LEA

Division of Mollusks
Sectional Library

The National Museum
ex dono auctoris
Isaac Lea

OBSERVATIONS

ON THE

GENUS UNIO,

TOGETHER WITH

DESCRIPTIONS OF NEW GENERA AND SPECIES IN THE FAMILIES NAIADES, CONCHÆ, COLIMACEA, LYMNÆANA, MELANIANA AND PERISTOMIANA:

CONSISTING OF

FOUR MEMOIRS READ BEFORE THE AMERICAN PHILOSOPHICAL SOCIETY FROM 1827 TO 1834, AND ORIGINALLY PUBLISHED IN THEIR TRANSACTIONS.

WITH NUMEROUS COLOURED PLATES.

BY

ISAAC LEA,

MEMBER OF THE AMERICAN PHILOSOPHICAL SOCIETY;
OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA;
OF THE LYCEUM OF NATURAL HISTORY OF NEW YORK;
OF THE GEOLOGICAL SOCIETY OF PENNSYLVANIA;
HONORARY MEMBER OF THE MEDICAL SOCIETY OF ORANGE COUNTY, NEW YORK;
CORRESPONDING MEMBER OF THE ZOOLOGICAL SOCIETY OF LONDON;
MEMBER OF THE ROYAL PHYSICAL SOCIETY OF EDINBURGH;
OF THE BRITISH ASSOCIATION OF SCIENCE;
CORRESPONDING MEMBER OF THE LINNÆAN SOCIETY OF BOURDEAUX;
OF THE NATURAL HISTORICAL SOCIETY OF MONTREAL;
ETC. ETC.

Division of Mollusks
Sectional Library

PHILADELPHIA:
PRINTED FOR THE AUTHOR,
BY JAMES KAY, JUN. AND CO.

SMITHSONIAN
JUN 18 1957
LIBRARY

594.1
.L43
cy.3
Mollusks

TO

PHILIP HOULBROOKE NICKLIN, M.A.

MEMBER OF THE AM. PHIL. SOC.,
AND OF THE ASHMOLEAN SOC. OF OXFORD.

My dear sir,

My first acquaintance with this branch of Natural History is connected with you; and when I look back to that period I always find you associated with my ideas. The great interest you have invariably taken in the labour of this volume, entitles you to an acknowledgement on my part; and I assure you it is with great gratification that I dedicate it to you.

Yours,
My dear friend,
Truly and sincerely,
ISAAC LEA.

Philadelphia, July 1, 1834.

INTRODUCTION.

In closing this volume, which I now do with my fourth Memoir, I look back with peculiar pleasure on the hours employed in investigating that family (the Naiades) which has been my chief study in zoology. Induced at first to the study of conchology by the desire of promoting my knowledge of geology, which recent discoveries prove to be almost a blank sheet without the chart of its sister science, I found myself launched into a new and delightful ocean, culling and choosing among nature's choicest and most favoured works. The geologists of the new schools regard shells as indicating, in the most positive and direct manner, nearly all the strata above the primitive, from the 'Lowest Fossiliferous Group' of De la Beche, to the highest of the series, the 'Modern Group,' (the 'Recent Period' of Lyell). Between the shells of all these strata and those now living there is a connection exciting almost a painful interest; for although we find recent deposits two thousand feet above the level of the sea,* containing species now inhabiting the neighbouring sea, with very few exceptions we always find, as we descend through the series, that the existing species and even genera gradually cease, until scarcely an individual can be recognized to have its living analogue.

---

* Principles of Geology, Vol. III. p. 126.

Taking this view of the science of conchology, it will be conceded that it points to objects of the highest importance, a thorough knowledge of our cosmogony.

In the investigation of the *Naïades* it has been frequently a matter of great regret to me, that opportunities have not afforded the means of examining further than I have been able to do into their habits and anatomy. The species within our reach here, are usually small, while many of those inhabiting our western waters are of great magnitude, and must afford, to those who can watch their habits and examine their structure, many curious and interesting facts in connection with their history.

I believe it has fallen to the lot of no naturalist to have made so great an accession to this family as will be found in these memoirs; and to have obtained so many not before known has been the combined result of industry and good fortune.

The cabinet of *Naïades*, of which these form a small part, consists in all of about one thousand nine hundred and fifty specimens, each one selected for its variety of form, colour or age. It includes one hundred and seventy distinct species, comprised in seven genera. The whole have been brought together within about eight years; and are from almost every important river in foreign countries as well as in this.

CONTENTS.

Description of Six New Species of the Genus Unio, embracing the Anatomy of the Oviduct of one of them, together with some Anatomical Observations on the Genus. 1 1828

Description of a New Genus of the Family of Naiades, including Eight Species, Four of which are New; also the Description of Eleven New Species of the Genus Unio from the Rivers of the United States: with Observations on some of the Characters of the Naiades. 17 1829

Observations on the Naiades, and Descriptions of New Species of that and other Families. 73 1831

Description of a New Genus of the Family Melaniana of Lamarck. . . 132

Observations on the Naiades; and Descriptions of New Species of that and other Families. 135

Observations on Lamarck's Naiades. 198

Systematic Index. 230

No. IV.

Description of Six New Species of the Genus Unio, embracing the Anatomy of the Oviduct of one of them, together with some Anatomical Observations on the Genus. By Isaac Lea.—Read before the American Philosophical Society November 2d 1827.

Preliminary Remarks.

IN the present contribution to the science of Conchology, I have endeavoured to be as brief as I thought the subject would permit.

I have often felt the great inconvenience sustained from too short and indefinite descriptions; and am therefore fully sensible of the necessity, for the proper distinction of the species, of a more minute notice of their characters than is usually given. In this Mr Barnes has shown a laudable example, and he deserves the acknowledgements of the conchologist*.

It will be observed I have followed his plan of dividing the margin of the disk into eight parts, reversing his posterior and anterior margins.

---

* Swainson says, "Although Lamarck has described so many (Uniones), the short descriptions he has given, and the want of figures to elucidate them, render it impossible to determine accurately one half the species which he has enumerated."

The genus *Unio*, established by Bruguières, and placed by Cuvier* in his fourth class of mollusques, les acéphales, and second family, acéphales testacés, or the mytilacés; and by Lamarck in his eleventh class, conchiferes, first order, conchiferes dimyaires, thirteenth family, les nayades; is to the conchologist one of the most interesting of all the genera. Recent American writers on the subject have added many new species to this genus, and other new ones are almost daily discovered.

I propose now to add six species, which I believe to be distinct from any hitherto described. In doing which, I give very exact descriptions accompanied by drawings, with a hope they may not hereafter be confounded with other species.

The constant and perplexing changes which the species of this genus assume have led even the accurate Lamarck into the error of describing several varieties as different species; and it is not without due hesitation and caution that I am induced to add the present. It has been doubtful with some conchologists whether the species of the genus Unio are not the mere varieties of one species†. To the naturalist, who has had the opportunity of examining numerous specimens, the gradations are so interesting, and at the same time so perplexing, that he is lost in the maze of their changes, and he seeks almost in vain to draw a distinctive line between them; for even the tuberculated shells sometimes pass by almost insensible gradations into smooth ones. Although this line may not always be satisfactorily drawn, I think their division into species should be retained, if it were only for the sake of system.

The comparative anatomist finds in the animal of the Unio an organization very far advanced towards a state of perfection. Lamarck places it, in his scale of perfection, higher than insects, and we cannot be surprised at this, when we examine its structure and find it possessed of brain, heart, branchiæ, liver, intestines, and an arterial and venous circulation, so complete as to excite our greatest admiration.

---

* Règne Animal, vol. ii. p. 453.

† The following genera, separated from the genus Unio, dipsas (Leach), hyria (Lamarck), alasmadonta (Say), damaris (Leach), cannot in the opinion of Mr Swainson retain their station among the genera.

Taking the natural position of the animal, I have reversed the anterior and posterior margins as used by Linnæus, Bruguières, Lamarck, Bosc, and others; and have followed Cuvier* and Blainville. That margin which has the ligament between it and the beaks is considered by Lamarck as the anterior margin, but it will be found on examination not entitled to be so considered, for two reasons: 1. The mouth over which is situated the brain is placed in the opposite margin. 2. When the animal is in progressive motion, this opposite margin is always pointed in the direction of its progress. I therefore follow Cuvier in his anterior and posterior margins, because they are founded in truth.

A recent and very accurate writer, Blainville, gives us so simple an explanation of the position in which a bivalve should be placed, that I am induced to extract it. He says—"We suppose the shell to cover the animal, and that it is passing from the observer, the head (mouth) in front. The beaks should be above—the ligament between the beaks and the observer. In this position the opposite side to the beaks would be the base, and the two extremes of the perpendicular diameter of this direction would be, the one anterior, the other posterior."

Of the habits of this animal we know little; future observations must open to us an interesting history of them. With regard to their food, it seems to be a matter of doubt upon what they subsist. I have strong reasons to believe they feed upon animalcula, which are ever found to exist in water and which they might separate from the constant stream, which they pass from the posterior part of the shell, and which must be taken in at another part. This interesting operation I witnessed frequently in a vessel in which I kept them for some months. If the water was not changed for twenty-four hours, I uniformly found my interesting captives perfectly quiet, but within a few minutes after it was changed, they as uniformly commenced the passage of this constant stream. I cannot suppose this operation to be for the sole purpose of breathing, as there is no intermission in the stream of the water, and the quantity thrown out is too great for this purpose only. I believe it to be the result of the action of the separation of the animalcula from the water.

---

* Règne Animal, vol. ii. p. 472.

Lamarck informs us that the animal of the anadonta (which is essentially the same with the unio) is hermaphrodite and seems viviparous; for the eggs pass into the oviduct placed along the superior branchiæ, where the young are found with their shells complete. In the dissection of an anadonta undulata nearly three inches long, I met with the oviducts charged with about 600,000 (as nearly as I could calculate) young shells perfectly formed, both valves being distinctly visible with the microscope.

There cannot be a doubt that the two pairs of muscles, which support the foot and serve by their alternate action to give the animal locomotion, are entirely distinct from the great anterior and posterior muscles, which seem but to serve the purpose of closing the valves opened by the elasticity of the ligament. The cicatrices of the muscles of the foot, anteriorly, are placed *under* the great anterior cicatrix, posteriorly *over* the great posterior cicatrix, and are sometimes confluent with the great cicatrices, sometimes entirely distinct from them.

It is necessary to notice here another set of attaching muscles, which seem to have escaped attention. We find, on closely examining the region of the cardinal tooth, a small irregular row of muscular impressions. In those species which possess large lobed teeth, these will be found generally on the inner side of them and somewhat underneath. In the more fragile shells, possessing comparatively small teeth, such as the alatus, gracilis, &c. we find these impressions in the cavity of the valve beneath the beaks. To this part of the shell I found in many species the animal to be quite strongly attached. It seems to serve to support the mantle, branchiæ,

&c. by the centre, and in this certainly serves a very useful purpose.

Being exceedingly anxious to examine the animals of the various species of the Unio from the Ohio, my brother, T. G. Lea, kindly sent me thirteen species and many varieties, which, with the assistance of Mr Stewart, were carefully dissected. Those consisted of the species mytiloides and metanevra of Rafinesque; siliquoideus, triangularis, gibbosus and cornutus of Barnes; purpureus, alatus, ovatus of Say; Æsopus of Green; irroratus and ellipsis now first described. This examination furnished me with several interesting results. It confirmed me entirely in my belief that the oviducts of the irroratus were different from any other species yet examined; a drawing and description of which will be found in this paper. The prolongation of the sacks of the oviducts is peculiarly interesting. In some of the varieties of the cornutus, which seem to run into the Æsopus, we found the posterior and inferior parts of the shell unnaturally extended. The mark of the animal on the shell had its usually curved shape, while the mantle, quite callous, extended to a protruded and irregular margin.

It has been a matter of speculation how the calcareous matter was secreted to increase the outer margin of the teeth as well as their whole surface. In this examination we found the surface of the broad teeth, some of which were near half an inch thick, to be completely covered with a prolongation of the mantle, extending from the great anterior to the great posterior cicatrix; so that when the teeth closed they completely enveloped it. This part of the mantle is exceedingly thin and transparent.

In the study of this genus, we are naturally attracted by the beautiful rays which frequently are found in the epidermis. This to the unpractised eye would seem to be a sufficiently distinctive characteristic to mark a species. There is, however, no character more fleeting and various. The young of many species uniformly possess rays, and we sometimes find fine adult specimens of extreme beauty. The naturalist is therefore obliged to abandon this character as almost useless. In noticing the colouring of the epidermis we must not pass unobserved the peculiar spots which are found on the cylindricus of Say, the metanevra of Rafinesque, and triangularis of Barnes. These have generally the form of an arrow-head, but sometimes so much elongated as to form rays. The hair like rays of the cornutus of Barnes and its varieties are peculiarly beautiful in fresh and perfect specimens; and the spotted lines covering the irroratus over its whole disk will yield to none of the painted epidermides.

In the measurements I have adopted the plan of Barnes: the greatest transverse line is the *breadth*, the greatest line perpendicular to this is the *length*, and the greatest line perpendicular to those lines, that is, from the most ventricose part of one valve to the most ventricose part of the other, is the *diameter*. We thus have the three greatest measurements of the shell, and the marginal descriptions give the form. It should be remembered that different localities produce various sizes, and even the thickness of the shell is frequently changed from this circumstance.

In considering the word "Unio" as of the masculine gender, I have followed the American conchologists, in opposition to Lamarck and other Europeans, who consider it as feminine. Ainsworth, in that part of his dictionary appropriated to pure Latinity, gives the following definition:—

Unio, onis, *m.* (*ab* unus, quod in conchis nulli duo reperiantur indiscreti, *i. e.* similes,) *A pearl, called a union*, because, many being found in one shell, not any of them is like the other. Plin. 9, 35. Unionum conchæ, *mother of pearl*. Suet. Ner. 31.

In Ainsworth's "Index Vocum Vitandarum" is to be found the following definition:—

Unio, onis, *f.* (quod unum facit) *Union, concord, agreement;* the number of one, Theol. (*In this latter sense it must be* masculine, as ternio, senio, &c. *J. C.)

---

* J. C. John Carey, the editor of the last edition of Ainsworth's quarto dictionary.

Trans. Am. Phil. Soc. III (3) 1828, p. 265.

It is evident, that the word explained by the former of these definitions is the most proper to express a genus of shells; and consequently, in *Conchology*, the word *Unio* is masculine.

---

1. Unio Calceolus. Plate III. fig. 1.

Testâ inæquilaterali, transversâ, aliquantulùm cylindraceâ, tenuiter rugatâ; dente cardinali prominente.

Shell inequilateral, transverse, somewhat cylindrical, finely wrinkled; cardinal tooth prominent.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of Prof. Vanuxem.

Diam. ·6, Length ·8, Breadth 1·5 inches.

Shell ventricose, cylindrical, transverse—substance of the shell thin, rather thicker anteriorly—beaks slightly elevated, undulated and touching; not decorticated—ligament short, partly concealed by the beaks—dorsal margin straight; posterior dorsal margin oblique and carinated; posterior margin angular; posterior basal margin curved; basal margin nearly straight; anterior and anterior dorsal and basal margins rounded—epidermis dark green at the margin and becoming lighter towards the beaks; rays indistinct—cardinal tooth of right valve prominent and somewhat pointed; the single tooth of this valve shuts in before the tooth of the left valve, instead of passing into it; the tooth of the latter valve is emarginate—lateral tooth very short and single in both valves—posterior cicatrices confluent, as are also the anterior ones—cavity of the beaks deep—nacre pearly, white and silvery, iridescent in the posterior margin.

Remarks.—This curious little shell is peculiar in its prominent curved tooth, shutting in before that of the other valve.

Its nacre is uncommonly silvery. It swells considerably along the posterior umbonial slope. This causes its greatest diameter to be semidistant between the beaks and posterior margin.

I have given a view of the right valve of this shell for the purpose of exhibiting its remarkable tooth. It might at first be considered as a malformation, but in the three specimens which I have seen this character has been uniform.

The calceolus approaches as nearly in its general appearance to the donaciformis as to any other species. It is however a thinner shell, and differs in the teeth as well as the colour of the epidermis.

2. UNIO LANCEOLATUS. Plate III. fig. 2.

Testâ transversim elongatâ, compressâ, posticè subangulatâ; valvulis tenuibus; umbonibus vix prominentibus; dente cardinali acuto, obliquo.

Shell transversely elongated, compressed, subangular behind; valves thin; beaks scarcely prominent; cardinal tooth sharp, oblique.

Hab. Tar River at Tarborough.
My Cabinet.
Professor Vanuxem's Cabinet.
Cabinet of the Academy of Natural Sciences.
Mr Nicklin's Cabinet.
Peale's Museum.

Diam. ·5, Length ·7, Breadth 1·7 inches.

Shell transversely elongated, elliptical—substance of the shell rather thin—beaks scarcely elevated, decorticated—ligament small, terminating between the beaks—dorsal margin slightly curved; posterior dorsal margin carinated; posterior margin subangular; posterior basal and basal margins curved; anterior and anterior dorsal and basal margins rounded—epidermis lemon-yellow and olive-yellow, with transverse lines of growth, glabrous—cardinal tooth compressed, crenulated and oblique—lamellar tooth straight, long and rather abrupt—posterior cicatrices confluent, anterior cicatrices distinct—

cavity of the beaks shallow—nacre salmon colour and iridescent; colour stronger under the beaks, from which beautiful fine rays diverge to the margin.

Remarks.—This species, which I have seen only in Tar River, N. C., approaches more closely to the unio pictorum of Europe than any yet discovered in this country. When I first found it, I felt assured it was the same; but upon closer examination and comparison find it to be essentially different. The cavity of the beak is much less and the cardinal tooth shorter and more lobed.

---

3. Unio Donaciformis. Plate IV. fig. 3.

Testâ inæquilaterali, transversâ, cuneatâ, rugatâ; dente cardinali prominente; umbonibus posticè angulatis; margine dorsali posteriori subcarinatâ.

Shell inequilateral, transverse, cuneiform, wrinkled; cardinal tooth very prominent; beaks angular behind; posterior dorsal margin subcarinate.

Hab. Ohio. T. G. Lea.

My Cabinet.

Diam. ·7, Length 1·0, Breadth 1·5 inches.

Shell not very thick, rounded before and pointed behind—substance of the shell not thick—beaks slightly elevated, not decorticated, almost touching; angulated by an oblique carina passing from the beaks to the posterior margin; this causes a slight concavity from the beaks towards the posterior margin—ligament passing to the point of the beaks—dorsal and posterior dorsal margins slightly curved, the latter sub-carinate; posterior margin acutely angular; posterior basal margin nearly straight; basal margin curved; anterior and anterior dorsal and basal margins rounded—epidermis olive, with green rays diverging from the beaks to all parts of the margin; surface glabrous and slightly wrinkled; has distinct marks of growth—cardinal tooth large, prominent, serrated; in the left valve deeply divided by the entering of the opposite tooth—lateral tooth abrupt—posterior cicatrices distinct, anterior cicatrices also distinct—cavity of the beaks rather deep—nacre pearly white and iridescent in the posterior margin.

Remarks.—The characteristics of this little shell are its angulated posterior slope giving it in some measure the form of a donax, and its large divided cardinal tooth. Its beautiful angulated beaks approach so closely together as scarcely to admit the edge of a piece of fine paper.

In its most prominent character, the peculiar angulated slope, it most resembles the ovatus of Say, but differs greatly in the size, the ovatus being four or five inches in breadth, and very much more inflated. The latter has a double cardinal tooth in each valve; the donaciformis only in the left valve.

4. UNIO ELLIPSIS. Plate IV. fig. 4.

Testâ figuram ellipseos habente, longitudinali, ventricosâ; valvulis crassis, umbonibus ferè terminalibus; dentibus grandibus et distinctis.

Shell elliptical, longitudinal, ventricose; valves thick; beaks nearly terminal; teeth large and well defined.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of Mr Nicklin.
Peale's Museum.
Cabinet of the Academy of Natural Sciences.

Diam. 1·3, Length 1·7, Breadth 2·3 inches.

Shell very thick, ventricose, margin elliptical—substance of the shell thick and ponderous—beaks thick and projecting beyond the margin, nearly terminal, decorticated—ligament partly concealed by the beaks—epidermis reddish-brown, smooth—surface somewhat wrinkled—cardinal tooth thick, elevated, compressed at top, crenulated; direction same as lateral tooth—lateral tooth long, thick and slightly curved, abrupt—posterior cicatrices distinct, as are also the anterior ones—cavity of the beaks small—nacre pearly-white, silvery and iridescent in the posterior margin.

Var. a—red inside, rare.
Cabinet of the Academy of Natural Sciences.
My Cabinet.

Remarks.—The ellipsis approaches somewhat to a variety of the mytiloides of Rafinesque, but is more swollen and ponderous, and differs in always having an elliptical margin.

5. Unio Irroratus. Plate V. fig. 5.

Testâ inæquilaterali, sub-orbiculatâ, longitudinali, tuberculatâ, rugosâ, longitudinaliter uni-sulcatâ; dente laterali abrupté terminante.

Shell inequilateral, suborbicular, longitudinal, tuberculated, wrinkled, longitudinally sulcated; termination of lateral tooth abrupt.

Hab. Ohio. T. Bakewell.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of the Academy of Natural Sciences.
Mr Nicklin's Cabinet.

Diam. 1·3, Length 1·8, Breadth 1·6 inches.

Shell extremely thick and swollen—nearly round, slightly elongated—substance of the shell thick and ponderous—beaks somewhat elevated and recurved, decorticated—dorsal margin rounded; posterior, posterior dorsal and posterior basal margins rounded; basal margin slightly emarginate; anterior and anterior basal margins rounded; anterior dorsal margin slightly rounded—epidermis yellow, but filled completely over with numerous dark green spotted lines, running in a sweep from the beak to the margin. In the anterior part the crowding of these lines generally forms five or six bands, the largest being in the furrow in the middle of the shell; in the posterior part there are no bands—disks transversely and deeply wrinkled, with a slight longitudinal furrow from the beaks to the basal margin—tubercles slightly elevated and numerous, and generally situated on the wrinkles; cardinal tooth wide, depressed and sulcated; lamellar tooth slightly curved, thick, rather depressed, short and abrupt—posterior cicatrices very distinct, the smaller one being placed directly over the larger one and beneath the point of the lamellar tooth—anterior cicatrices distinct, the great one deep—cavity angular and exceedingly small for the size of the shell—nacre pearly white and silvery.

Remarks.—The very minute and delicate spotted lines which pass from the beaks to the margin of this species well characterize it. They are so fine and approach so nearly to each other as to give a general olive appearance to the disk, the ground of which is really yellow. I have not observed this to pervade completely the surface of any other species, and in this it is constant. The substance of the shell is exceedingly massive and ponderous, more so for its size than any other species which I have seen. The animal is the only one in the organization of which, during my examination of this genus, I have been able to detect any essential difference. From the shell being longitudinal and peculiarly massive, we might be led to suspect a conformation different from the other species, and such is the case.

By the exertion of my brother T. G. Lea, I have been fortunate enough to obtain three individuals of this species in a state of impregnation considerably developed. In those I observed an appendage, in form of a depressed cone, attached to the branchiæ on either side, and a very slight examination fully satisfied me these were the oviducts.

In all the other species which I have examined I have found the ovaries and oviducts as described by Cuvier, Bosc, Carus, &c. The oviducts in these lie in a direct line between the two great muscles, and are attached to the upper pair of branchiæ. In the irroratus this space is so small, as is also the cavity, that it seems to require a different conformation to accommodate the oviducts, and thus we find them *pendent*, and not placed along the plane of the branchiæ. The long sacks containing the ova are inserted about half way up the branchiæ and somewhat posterior to the centre. The number of these sacks in my three specimens consists of eight in two, and seven in the other. The posterior sack is the outer or surrounding one, and measured two inches; the second and fourth 2·2; the third 2·4; the fifth 1·9; the sixth 1·6; the seventh 1·4. In diameter the sacks are nearly the same size, the interior ones being rather smaller than the exterior, which measures one-twentieth of an inch.

These measurements were effected by separating the membranes which connect the sacks together and stretching them out. The diameter of the cone is ·6; its elevation ·2 of an inch. The outer sack terminates after making one revolution; the second advances one-third on the succeeding revolution, and each succeeding one obeys the same law until the last terminates in the centre, and the mass having performed three revolutions, the whole forms a depressed cone.

This curious arrangement of the sacks to form the depressed cone, which has its base resting on the region of the stomach, is admirably calculated by the economy of nature to harmonize with the construction of shell, which presents only at the centre of its disks room for the essential purpose of propagation. See plate V.

Fig. 6 represents the interior, fig. 7 the exterior of the oviduct, the mantle being removed.

a the mouth.
b the great anterior muscle.
c the superior right branchiæ.

d the great posterior muscle.
e the inferior right branchiæ.
f the right oviduct.
g the foot.
h the superior left branchiæ.
i interior view of the oviduct.

---

6. UNIO LACRYMOSUS. Plate VI. fig. 8.

Testâ sub-quadrangulari, inæquilaterali, posticè angulatâ, transversâ, tuberculatâ; dente laterali abruptè terminante.

Shell subquadrangular, inequilateral, angular behind, transverse, tuberculated; termination of lateral tooth abrupt.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.

Diam. ·9, Length 1·7, Breadth 1·8 inches.

Shell rather depressed and rounded anteriorly—substance of the shell thick—beaks slightly elevated with the ligament passing between them, recurved and almost touching, free from decortication, and covered with beautiful delicate raised points—when viewed on the back all the visible part is covered with them—dorsal margin oblique; posterior dorsal margin subangular, carinated; posterior margin angular; posterior basal margin emarginate; basal, anterior and anterior dorsal and basal margins rounded—epidermis yellow-green and very smooth, almost white at the point of the beaks, anteriorly slightly rayed—disks tuberculated, having a smooth channel, margined by two rows of tubercles or raised points, running from the point of the beaks, and diverging one to the basal, the other to the posterior margin—tubercles, enlarging towards the base, taking the form of flowing tears, and resembling coagulated gum; they are very minute at the point of the beaks—undulated delicately along the posterior dorsal margin—have one distinct line of growth—cardinal tooth very wide, depressed and sulcated—lamellar tooth straight, short, crenated and abrupt—posterior cicatrices confluent; anterior cicatrices distinct, the great one deep and partly surrounding the cardinal tooth—cavity not deep, but angular, and extending under the cardinal tooth—double impression of the mantle very perceptible—nacre pearly white and silvery.

Remarks.—This rare shell forms without doubt the most beautiful and perfect species yet discovered of this genus. Its beautiful tubercles, lively colour and delicately pointed white beaks, together with its strikingly pure nacre, entitle it to a precedence over all that have yet found their way to our cabinets. The form of the tubercles is very peculiar and they distinctly mark this fine species. The specimen represented in the drawing is the largest of five which I have seen.

This species is more nearly allied to the metanevra of Rafinesque than to any other. It differs however, essentially, in its having a greater number and more distinct tubercles; its colour, and the tuberculous ridge of the latter being replaced by a smooth furrow, enlarging from the beaks to the posterior basal margin and bordered by two rows of small tubercles. The metanevra is also larger and more ponderous.

No. XIII.

Description of a New Genus of the Family of Naïades, including Eight Species, Four of which are New; also the Description of Eleven New Species of the Genus Unio from the Rivers of the United States: with Observations on some of the Characters of the Naïades. By Isaac Lea, M.A.P.S. M.A.N.S.P., &c. Read March 6th, 1829.

I HAD the pleasure to present to this Society in November, 1827, a description of six new species of the genus Unio, which they did me the honour to publish. Since that period I have continued to collect and examine the genera of the family of *Naïades* with great interest, and more success than I could have anticipated. I propose in this paper to describe fifteen new species, a number which rarely falls to the lot of a naturalist at one period; and I shall previously indulge myself in some observations respecting their characters, habits, &c.

Strong objections have been made to the study of conchology by persons unacquainted with this branch of zoology, and it has been alleged that a collection of shells is merely a collection of the houses or habitations of an animal carefully removed by the naturalist or destroyed by other causes, and therefore unworthy the time and attention of the student of nature. This assertion betrays ignorance, and recoils on the observer; for it may with truth be said, that no part of the works of nature, however minute or unimportant to the passer by, can be examined without creating in the student of nature the utmost wonder and astonishment.

In this class of animals nature seems not to have worked with the hand of a stepmother; she put them out of her lap after having lavished her bounties upon them in the utmost profusion. All the tints and combinations of the colours of the rainbow are called to adorn their coverings; and in the form of the shells we have almost all the figures that the science of geometry can present. Who can watch the common snail of our woods, and see him commence at a mere point, from which he builds his covering by a secretion from his own body and turns it with the most mathematical exactness, without exclaiming, Thou art indeed a great geometrician! and when he comes to finish his arched entrance, graced with a curvation pure and as white as marble, who can refuse to acknowledge him an accomplished architect?

In viewing the covering of this class of animals, I consider it as in some measure analogous to the skeleton in the vertebral animals. The muscular attachments, of which there are many, to the two valves of the conchifera, may be viewed as the attachments of the muscles of the animal frame to the bones, by which we are enabled to enjoy locomotion. The ligament, which firmly connects, exteriorly, the two valves, may be assimilated to those ligaments whose almost exclusive service is to connect some of the important bones of the human skeleton.

Is it reasonable to consider the valves as merely a habitation for the animal? Are they not always acting a more distinguished part? The ligament, beautifully formed of a combined horny and fibrous substance, is ever in action while the animal lives, and this action is counterbalanced by the contraction of the muscles attached to the interior of the valves. The epidermis too has its duty to perform in protecting from decomposition the calcareous matter of the shell. It is composed of a thin horny substance—somewhat like that of the exterior part of the ligament. The prolongation of the epidermis beyond the margin of the shell seems well adapted, when the animal closes the valves, to exclude the entrance of water, &c., and doubtless is thus used.

When a conchologist examines a shell which to him is new, almost the first question he puts to himself is, "what must be the form of the animal which once inhabited this covering?" He judges by analogy; and after examining the form of the shell, he has generally a very good idea of its former inhabitant, and although he may not be able to decide with the same precision as the osteologist, he can place it in its proper family.

Each family has a form of shell adapted to the wants of its inhabitant, and peculiarly fitted for its locomotion or its fixed situation. Thus the Ostracea could not exist in the shells of the *Naïades*, although the forms of the animals are not very dissimilar to the unpractised eye. The naturalist, however, sees in the former the entire want of the muscular foot for locomotion and its attendant pairs of muscles. In the valve of this he sees but one muscular impression, which muscle is used for the sole purpose of closing the valves, while in the other he sees at least four, two of the muscles of which are used for protruding, the other two for retracting the foot by which it propels itself. The species of the family Mytilacea attach themselves by a strong byssus to stones, &c., and therefore require a very differently constructed shell. The Lithophaga bore into stone, wood, mud, &c., and have no power of locomotion. The Solenacea generally live in pits, and move only between the two extremities of them. To these families might be added many more, all of which are as different in form and habits, as can well be imagined. It may therefore be safely asserted that the student of conchology can always form some idea of the animal from the form of the shell.

My attention having been particularly drawn to the study of the family of the *Naïades*, and my cabinet possessing a great number of species and varieties, I feel induced in this preliminary matter to say something on the species of the

Uniones, described by naturalists who have written on our shells.

The genus Unio presents in the waters of the United States, particularly in the rivers west of the Alleghany mountains, a number of species almost extending beyond belief. Nature has scattered them here with the hand of profusion, after having formed them with the most harmonising beauties.

The number of the species adds greatly to the difficulty of distinguishing them, for they glide into each other so insensibly through their varieties, that the most experienced are often at fault and perplexed with the difficulty of placing them properly in the most approved systems*. But, although we may at every step meet with these difficulties, I cannot suppose that most of those described as species do not exist; the fault has been that mere varieties, in the eagerness of authors to make species, have too often been erected into species, and the great Lamarck has committed this error in as great a degree as almost any other writer.

It is the opinion of some eminent conchologists that the family of the *Naïades* possesses but one genus, and that the genera into which it is at present divided are only species, and the species varieties. Were we to adopt this division, we should be in a worse dilemma than before; for we can scarcely imagine bivalves more different from each other in form than are some of our trans-Alleghany species of Unio.

How totally different is the *rectus* of Lamarck from the *irroratus?* (nobis). The first is four times the width of its length, whilst the latter is longer than broad. The one is broad rayed, in fine specimens; the other possesses dotted lines universally. The *triangularis* of Barnes is entirely dissimilar to the *nasutus* of Say, as is also the *circulus*, herein described, from the *lanceolatus* (nobis); and the same may be said of *peruvianus* and *pictorum*. Two species could be scarcely more unlike than the smooth and radiated *siliquoideus* of Barnes and the beautiful tuberculated *lacrymosus* (nobis); and the same remark may be applied to the *cylindricus* and *alatus* of that excellent conchologist Mr Say. Many other species could be thus contrasted, but I deem the above sufficient, upon examination, to prove the justness of my remarks, and the necessity, in the present state of our knowledge, to retain the species, whatever may be the changes in the genera*.

---

* Swainson says, "Indeed so much uncertainty hangs on the shells of this genus, that the species can only be fixed by ample descriptions and very correct figures."—*Zool. Illus. Vol. I. t.* 57.

In a preceding paper on the Uniones I said something on the habits of the animal. I wish now to mention the simple fact that I have kept several specimens about ten months in a basin changing the water every five or six days. During this period they passed through the winter without any change in their usual habits, and nothing in the shape of food was given during the whole period.

This truly interesting family presents us with very difficult specific characteristics, rendered so by the species constantly approaching in similitude to each other, and by the change made in them by age, locality, and exposure.

I propose to offer a few observations on the principal characters, in which it will be seen how little we can depend on any one of them, and shall begin first with the teeth.

Teeth. In the species of the Unio these have been used as strongly characteristic, but we cannot place much reliance on this character, unless accompanied by and dependent on others. Thus, the angle of the cardinal tooth depends much on the location of the beaks, and we know that in the same species the location is quite different, and yet this difference is not worthy of creating even a variety. If the beaks be placed immediately over the anterior margin*, as in the *ellipsis* they generally are, then the cardinal tooth will be nearly or quite parallel to the lamellar one; but if the beaks be more posteriorly placed, then the cardinal tooth becomes more oblique. We must, therefore, when characters are so difficult, look at them in combination, and adopt them with due consideration.

---

* In a letter addressed to me by William Cooper, Esq., an intelligent naturalist of New York, he says, "There are now, I think, not less than thirty North American species of Unio well established, and perhaps seven or eight more. That they are species, each perpetuating its peculiar form, subject to certain variations, but permanent within fixed limits, seems to me the most rational opinion, although some of our most judicious naturalists think otherwise. Your account of the animal of the *U. irroratus* affords a strong argument in favour of this belief, for it proves that to be beyond doubt as distinct a species as any in any class of animals. Yet this may always be known with certainty by the shell, which, though so well characterised, is not, however, more different from the rest of the genus, than they are from each other, and frequently still less so. If, therefore, this difference is found to be constantly indicative of a species in one instance, it must also be in others. I believe that our lakes and rivers contained the same form of shells at the creation and ever since that they do at this day. If they are hermaphrodite per se, as is said of them, it could not be otherwise; and if the contrary were admitted, natural history would not deserve the name of a science."

In the same species the mass or substance of the valves varies much according to localities. Thus we find the *complanatus*† in some of our Atlantic rivers full grown, when only an inch broad, while in other of our Atlantic rivers we have them four inches broad. In some localities we have them possessing but little calcareous matter, while in others they are almost massive. This also occurs in perhaps a greater degree with some of the western shells. And if we examine a massive specimen, we are almost sure to find the cardinal teeth more or less thick, whilst those of the same species which are thin, and they frequently differ very much in this respect, will be found to possess cardinal teeth of quite a crested structure. The cardinal tooth, being single in one and double in the other valve, or double in both valves, cannot be depended on as an unfailing character. The same species will often present double teeth in both valves, although it may be usual to possess them in the right valve only. The lamellar tooth depends much on the substance of the specimen. If it be massive the teeth will be thick, if thin more bladed; the teeth, therefore, differ almost as much in varieties as in species. We must, consequently, while examining a specimen to determine its species, give due attention to these counteracting characters.

---

* I reverse Lamarck's anterior and adopt Cuvier's as heretofore.

† *Purpureus* of Say.

Colour. The colour of the Uniones is generally a deceptive character. This, however, is not always the case, and therefore it deserves the attention of the conchologist. In some species it is permanent in the nacre, in others it is permanent in the epidermis. In the following species I have always found the nacre to be white and pearly, viz. *cornutus*, *tuberculatus*, *siliquoideus*, *ventricosus*, *ovatus*, *triangularis*, *parvus*, *plicatus*, *metanever*, *æsopus*, *scalenius*, *cylindricus**, *lacrymosus*, *irroratus**, *ellipsis*†, *donaciformis*, *calceolus*, *heterodon*, *multiradiatus*, *occidens*, *securis*‡, *iris*, *zig-zag*, *patulus*, and *planulatus:* the last eight herein described. In the "*torsa*" of Rafinesque, and *sulcatus* (herein described), the purple is permanent and generally dark. In the *subtentus*, *lanceolatus*, and *rubiginosus* (herein described), it is a pale salmon colour, and in the *ater* (herein described) it is a pink bordering on purple. The *gibbosus* is generally a dark purple or chocolate, but varies from this through all the intermediate shades to perfect white. The *verrucosus* is either chocolate or white, and does not seem to enjoy the intermediate tints. The *circulus* (herein described) is generally of a pure pearly white, but sometimes, though rarely, possesses a blush of pink in the centre of the valve. The *mytiloides* presents all the shades from the deepest flesh colour to the purest white. The *cariosus* is generally white, but sometimes is found of a deep salmon and the intermediate shades. The *nasutus* is either pearly white or approaching salmon colour under the beaks. The *rectus* is generally of a beautiful porcelanic white, sometimes tinted about the cardinal teeth and in the cavity of the beaks with purple or salmon, more generally the former: specimens are rarely found with the nacre entirely coloured. The *complanatus*, of which so many false species have been created by European naturalists, presents us with more colours and shades than any other species except the *cuneatus* of Barnes, which by many conchologists is considered analogous to it. These two species present us with specimens of the darkest purple, the purest white, the richest salmon, and all their intermediate shades. The fine indistinct striæ of the nacre, which are sometimes observed to diverge from the interior of the beak to the margin, are caused by the successive removals of the marginal attachment of the mantle.

---

* The *cylindricus* and *irroratus* sometimes, in very perfect specimens, present a slight golden appearance in the nacre at the anterior margin.

† Var. *a* being herein described as a new species.

‡ This is Rafinesque's "*U. depressa*," but the name being preoccupied by Lamarck, apparently without the knowledge of Mr R., I am compelled to give it a new name or leave it out of the catalogue. I prefer the former alternative, as it is a distinct and beautiful species, and well known to most of our conchologists under its duplicated name "*depressa*." In this I act in accordance with the rules of nomenclature in natural history. See description.

It should be borne constantly in mind that the colour of the nacre is an extremely doubtful character in the family of *Naïades;* in exemplification of which I have an Anodonta from the Ohio, *the nacre of one valve of which is salmon and the other white.* The valves are beyond all doubt of the same animal. The green irregular spots and marks sometimes described to exist in our Uniones deserve no attention, as they are altogether accidental, perhaps the effect of disease: they are more frequent in the *rectus* and *cylindricus.*

Elevations on the surface of the disks. These are sometimes tuberculated, sometimes undulated; and our western waters are the only ones we know of which produce many species thus marked. There they exist in great variety and exceedingly great beauty. The *U. tuberculatus* and *U. lacrymosus* possess more tubercles than any other species. The *U. verrucosus* possesses them irregularly scattered over the sides of the valves. The *U. metanever* and *U. cylindricus*, besides the irregular elevations over the disk, have remarkable undulations along the umbonial slope*, from the beak to the margin. The *U. cornutus* is furnished with three or four protuberances or "horns" in a row, passing from the beaks direct to the basal margin; the varieties of the *cornutus* have these

---

* I use this term for the elevated *ridge* which passes from the beaks to the posterior margin.

"horns" more depressed and more frequent, and thus pass into varieties with a mere furrow without any distinct elevations, and these gradations are almost innumerable. The *irroratus* has slightly elevated tubercles along both sides of the furrow; these are sometimes continued along the wrinkles, making them elevated. The *æsopus* has a "nodulous ridge" over the middle of the shell, and the *plicatus* has folds or waves over the posterior part of the disks, more or less numerous, and which are so large as to produce an irregular effect through the nacre in many instances.

The epidermal colours of this family are exceedingly circumscribed. The ground varies from deep fuscous or black to pale yellow, frequently passing through obscure green, rarely bright green. This ground is intersected frequently with rays or spots of a darker hue. In fine and perfect specimens these are generally perceptible, sometimes eminently beautiful. In imperfect or old specimens these marks are almost always obliterated. The following species, when the specimens are perfect and fresh, occur beautifully painted with rays more or less broad: viz. *complanatus*, *cuneatus*, *radiatus*, *siliquoideus*, *ventricosus*, *ovatus**, *cariosus*, *nasutus*, *lacrymosus* (very slightly), *calceolus*, *rectus*, *ochraceus*, *heterodon*, *sulcatus*, *multiradiatus*, *occidens*, *iris*, and *zig-zag*.

The *securis* is rayed in a manner peculiar to itself. (See description.) The *cornutus* has beautiful hairlike lines, sometimes minutely waved, which diverge to its entire margin. Some of the varieties have no rays, while others have comparatively broad and beautiful ones. The *sulcatus* is indistinctly rayed over the umbones†, but the furrow passing from the beaks to the posterior basal margin has many hair like lines, which are minutely waved; these lines are continued over the umbonial slope. The *irroratus* is covered over the whole disk with dark green spotted lines, running in a sweep from the beak to the margin and lying close to each other.

---

* Mr Say says this shell is "not radiated." This is generally the case: but some specimens are beautifully rayed; and Lamarck says of his var. *b*, "testâ radiis longitudinalibus pictâ."

† I use this term as Linnæus did: it is the "*ventre*" of the French writers. Draparnaud says, "la portion la plus renflée des valves." It is improperly used by English writers denoting the beaks or summits.

The following species have broad interrupted rays, which in some instances make rows of square spots: viz. *planulatus*, *scalenius*, *verrucosus* (when young), and *patulus*.

The *donaciformis* and *zig-zag* have diverging rays formed more or less distinctly by zig-zag lines. The *cylindricus*, *metanever*, and *triangularis* are singularly and most beautifully marked with dark green spots in the form of an arrow head, the point directed to the margin. The first and last possess the most; in the others it can only be distinguished in very fine or young specimens. The marks sometimes exist in a confluent state, and rays are consequently produced. They are most prevalent in the *cylindricus*, and vary from the length of a quarter of an inch to a mere point; in the *triangularis* they are more generally confluent. Some specimens of *cylindricus* are so much charged with these arrow-headed marks as almost to obliterate the yellow ground of the epidermis, and cause the valves to appear at first sight of an uniform dark green.

The remainder of the American species described are without epidermal markings, and I shall divide them, as it is extremely difficult to designate their shades, into blackish, brownish, and yellowish. The *ater*, *tuberculatus*, *circulus*, and *gibbosus*[*] are blackish. The *circulus* is peculiar in having the posterior slope yellowish. The *parvus*, *torsus*, *plicatus*, *mytiloides*, *æsopus*, *subtentus*, *verrucosus*, *ellipsis*, *rubiginosus*, are brownish. Some of these, however, vary much. The *torsus* is found sometimes yellowish, and when young almost black; the posterior slope is, however, universally yellowish. Large and old specimens of the *plicatus* are quite black; the young are light brown. In the *mytiloides* the young specimens are sometimes rayed over the umbones. The young *æsopus* is bright yellow and highly polished. The young *verrucosus* has sometimes one or two broad interrupted green lines over the middle of the umbones. In young or very perfect specimens of the *ellipsis* may be seen numerous small rays passing over the umbones towards the posterior margin. In the younger specimens of the *rubiginosus* indistinct rays are sometimes seen. The *lanceolatus* is yellowish passing into olive.

---

[*] The young *gibbosus* is sometimes very obscurely rayed.

It should ever be borne in mind, notwithstanding what has been said above, that colour is exceedingly deceptive, and may often lead to error. It is impossible to find permanent characteristics in it, on which we can universally depend, as locality, exposure, youth, and age so materially affect its appearance. We must therefore consider it in most cases as only auxiliary, though in a few cases it is permanent.

Beaks. Lamarck, in his generic description of the Unio, says, "natibus decorticatis, suberosis." This character is not permanent by any means in our species, some of which are almost universally found free from decortication, while others are partially so; and others again rarely free from it. The objection to receiving it as a permanent character even in species is, that more or less exposure to the action of the stream, &c. will cause the beaks to be more or less eroded in the species where erosion takes place. Some species, however, seem to resist this erosion with great success, owing, as I apprehend, to the peculiar firmness of the texture of their epidermis, which certainly differs in different species. I have never seen either of the following species eroded, viz. *U. parvus*, *U. calceolus*, *U. lacrymosus*, *U. rubiginosus*, or the *Symphynota lævissima* (the two last herein described). It is rarely we see a ponderous shell free from this erosion, and the *U. cylindricus* seems to be peculiarly subject to it, for the form of the beaks can rarely be even traced, yet the largest specimen in my cabinet, nearly five inches broad, possesses the epidermis untouched on this part. The beaks of many of the species, when found in a perfect state, are crowned with concentric undulations or slight elevations, which should always be noticed, as they are highly characteristic. The situation of the beaks, when peculiar, should have the student's attention. They are sometimes almost medial, as in the *U. irroratus*, *U. circulus*, *U. lacrymosus*, *&c.;* while in the *U. ellipsis*, *U. scalenius*, *U. cylindricus*, *Symphynota tenuissima**, *&c.* they are almost terminal: this character, however, varies. (See observations on the teeth.)

The *margins* or circumference should have our attention in examining a specimen. The general form of the *Naïades* is ovate, modified into rhomboidal, triangular, circular, and elliptical; but these forms in the same species will frequently vary, and therefore must not be entirely relied on. The *U. siliquoideus* is generally subangular posteriorly, but it is sometimes truncate, and the *U. cariosus* is found in the same way. We find very few species that are constant in this character; this accounts for the many species created from the *U. pictorum* in Europe.

Muscular impressions. These are important and should always have our attention in examining a specimen. But even this character is not infallible. It should be understood that the animals of this family always possess two pairs of muscles, used for locomotion, and placed near or in contact with the two adductor muscles, used solely for closing the valves†. In the anterior margin these are generally separate, in the posterior more generally confluent; but in the same species we sometimes find individuals presenting two, sometimes three, and sometimes four cicatrices, besides those of the cavity of the beaks; and this depends in a great measure on the thickness of the shell. If the specimen be ponderous, we often find the posterior muscle of the foot attached to the side of the lamellar tooth near to its termination; if it be thin, although of the same species, it will be found generally confluent or near to the great posterior muscle. The cicatrices, made by the attachment of the superior part of the mantle in ponderous shells, generally will be found on the under part of the cardinal tooth. Sometimes six or eight may be found; and their direction is towards the lamellar tooth. In thin shells these cicatrices will be found in the cavity of the beaks, generally traversing it in an oblique direction[*].

---

* Herein described.

† Seem y description of new Uniones in this volume.

Ligament. This part of the shell must be viewed with the same doubt as the above character. In the same species the ligament may be long and narrow if the specimen be elongated and thin; and it may be short and thick if it be ponderous and obtuse. Thus we may find in an elongated *siliquoideus* the ligament an inch and a quarter long, and only one-tenth of an inch broad, while in an obtuse and ponderous specimen it may be found to be only three quarters of an inch long and yet one-eighth of an inch broad, as is the case in some specimens of my cabinet.

It has been a desideratum with the American conchologists to fix the nomenclature of this interesting genus, particularly so far as relates to our own species. In the hope of contributing in some measure to so desirable an object, I have carefully examined all that has been published on the subject so far as I could procure the descriptions, and with diffidence give the results, hoping my views may not be found to be incorrect.

The first column contains the species, the nomenclature of which is now likely to be permanent and fixed. The second the species described by other writers, which are either the same or varieties, and consequently synonymes.

1. U. radiatus[†],	Gmelin,	1. radiata,	Lam.
		2. virginiana,	Lam.
		3. radiatus,	Barnes.

---

[*] See my description of new Uniones in this volume.

[†] Lister (t. 152, f. 7.) gives a correct representation of the species known to American conchologists as *U. radiatus*, and which he says came from Virginia. Chemnitz (vol. vi. t. 2, f. 7.) gives a representation of a shell very similar to it, the locality of which is Malabar. The first name we find for it is in Gmelin, *Mya radiata*, and this author refers to both figures in his description. Dillwyn re-

2. U. complanatus†, Soland. MSS.	purpureus,	Say.
	rarisulcata,	Lam.
	coarctata,	Lam.
	purpurascens,	Lam.
	rhombula,	Lam. var. *b*.
	carinifera,	Lam.
	georgina*,	Lam.
	sulcidens,	Lam.
	caroliniana,	Bosc.
	fluviatilis,	Green.

---

fers to each of the above authorities, but thinks Lister's figure is too doubtful to be retained, as Solander had referred to it for a variety of *Mytilus modiolus*, in which, however, he errs, for Lister's figure is a good representation of a small specimen of the *radiatus* of our waters. Lamarck, in his description of "*U. radiata*," refers to Lister and Gmelin, and also to the figure of Mr Say's *ochraceus*. The last is a distinct species. Several of these writers refer also to the figure in the Ency. Meth. t. 248, f. 5, which is evidently copied from Chemnitz. Mr Barnes, in his description, refers to Say's *U. ochraceus*, Dillwyn's *Mya radiata*, and Lamarck's *U. radiata*. Considerable difficulty presents itself in establishing the name of this species, so well known among us by that of *U. radiatus*, in consequence of the old writers using the same name for those from Virginia and Malabar, which, I believe, when examined together, will be found specifically to differ. Should this prove to be the fact, we must give to our shell the name which Lamarck has described it under a second time, viz. "*U. virginiana*," giving it a masculine termination.

* It should be mentioned here that I was not aware that Mr Barnes had pronounced the first six to be varieties of Say's *purpureus* until after I had selected the seven.

† The celebrated *Lister* published his great work on conchology in 1685, and at that early period he was in possession of several species of our fluviatile shells procured from Virginia. The first he thus describes, "musculus brevior, admodum crassus, ex interna parte subroseus, cardine incisuris minutis exasperato," t. 150, f. 5. Dillwyn describes this shell under the name of *Mya complanata*, and refers to this figure. Beside the locality above, Solander gives Maryland and New Jersey, and Humphreys Mississippi. The latter is most likely an error. Dr Green supposed this shell, so well known to all our conchologists under Mr Say's name *purpureus*, to be the *Mytilus fluviatilis* described by Dillwyn from Gmelin, and referred to Lister, t. 157, f. 12. I differ, however, in this opinion, 1. Because it is not described as being toothed. 2. Gmelin says, "habitat in Europæ aquis dulcibus." 3. The *complanata* answering, in description, better to our shell, and being the first figured and described. It appears somewhat singular to me, that the observant and able zoologist, Mr Say, had not been struck with the similitude of our shell to Lister's figure and description. There is no species more common in all our fresh waters, east of the Alleghany mountains, than this, and nothing could be more likely than that it should be among the first to be taken to Europe by the early voyagers to North America. In accordance,

3. U. ovatus,	Say*,	ovata,	Lam.
		ovata,	Valenciennes.
4. U. cariosus,	Say†,	luteola,	Lam.
		cariosa,	Lam.
		crassus (old)‡,	Say.
		carinatus (rayed),	Bar.
		ellipticus (young),	Bar.
5. U. nasutus,	Say,	rostrata,	Valen.
6. U. cylindricus,	Say,	naviformis,	Lam.
		naviformis,	Valen.
7. U. subtentus,	Say.		
8. U. plicatus,	Le Sueur§,	crassidens ?	Lam.
		peruvianus,	Lam.
		rariplicata,	Lam.
		undulatus,	Bar.
		crassus,	Bar.
		undulata,	Valen.
		dombeyana,	Valen.

---

therefore, with the rules of nomenclature, I have inserted the name of *complanatus* to the shell described by Mr Say under the name of *purpureus*.

* Dr Hildreth, in describing this species of Say, says, "I think it a near relation of the *gracilis;*" and, when describing the *gracilis*, he says, "The contour of the shell, independent of the wing, is much like that of the *alatus.*" In the latter he is right, but in the former remark altogether wrong.

Donovan, Dillwyn, Maton and Racket, and some other British writers have made use of this name for a Unio resembling the *pictorum.* I have thought it better, however, to retain Mr Say's name for his species, which is totally different, being satisfied that the British shell is only a variety of *pictorum.*

† This is probably the only species yet known to be common both to the Western and Atlantic waters.

‡ *Crassus* is omitted in this catalogue, believing that several other species, and those only because they were ponderous, have been described under this name. Mr Say's *crassus* (See Am. Conch. plate 1, fig. 8,) is evidently an old and ponderous *cariosus*, and he considered the "*plicatus*" as a variety. Mr Barnes's *crassus* is an old and thick *peruvianus*, as is most likely Lamarck's *crassidens.* The *giganteus* of Dr Mitchill's collection is also a *peruvianus*, which occurs in some of our western waters of a larger size and more ponderous than any species we know of.

§ This species was first described by Say in the American Conchology as a va-

9. U. rectus,	Lam.*	prælongus,	Bar.
		nasuta,	Lam.
		purpurata ?	Lam.
		recta,	Valen.
10. U. torsus†,	Rafinesque.		
11. U. mytiloides,	Rafin.	undatus,	Bar.
12. U. metanever,	Rafin.	nodosus,	Bar.
		rugosus (flat),	Bar.
13. U. scalenius,	Rafin.		
14. U. cornutus,	Bar.‡		

---

riety of *crassus.* At the same time he mentioned that its discoverer, that excellent naturalist Mr Le Sueur, suspected it to be a new species, and proposed, should this prove to be the case, to call it "*plicata.*" We are, therefore, bound to adopt his name on the claim of priority; and a more descriptive one could not be given to it.

[*] When Dr Hildreth described the "*prælongus,*" it is evident he believed it to be *prælongus* of Barnes, for he uses Barnes's name without stating it to differ from his, although the descriptions are not exactly the same. Barnes says, "Naker, *purple* of different shades," and "deep and splendid purple." (See Barnes's Reclamation.) Hildreth says, "Naker, *white*, and tinged with spots of green."

The specimen of "*recta,*" described by Lamarck, was "white," according to his description. I have seen very many specimens of this species, some of which are tinted with light purple or salmon about the cavity of the beaks and cardinal tooth; they are generally, however, of a pure white. The explanation of these contradictory characters is this: The specimen in the collection of the New York Lyceum, and the same is said of one in Dr Mitchill's collection, both brought from the upper lakes, is unusually full of colour, having almost the whole of the nacre of a rose or delicate purple. It has more colour than any specimen I have seen.

[†] M. Rafinesque is entitled to a preference in this beautiful and extraordinary species, possessing the most elevated recurved beaks of the whole genus. It was generally known among us by the name of *U. orbicularis*, but not described. The variety, not emarginate, can not be made a species, as the two pass into each other. Dr Hildreth has recently described a shell, which I believe to be the *torsus*, in Silliman's Journal under the name of *U. orbiculatus.* He says, "This shell is a variety of the *crassus.*" Whose *crassus?* Mr Say's, as mentioned before, is a ponderous *cariosus;* Mr Barnes's, a *peruvianus;* and, if a *variety* of *crassus*, why call it *orbiculatus?*

[‡] This species is among the most interesting of the genus. It presents a much greater variety than any other, and might be called a real *proteus.* The true

15.	U. verrucosus,	Bar.	verrucosa,	Valen.
			tuberculosa,	Valen.
16.	U. tuberculatus,	Bar.		
17.	U. gibbosus,	Bar.	mucronatus,	Bar.
18.	U. cuneatus*,	Bar.		
19.	U. ventricosus†,	Bar.		
20.	U. siliquoideus,	Bar.	inflatus,	Bar.
21.	U. triangularis,	Bar.		

---

cornutus has three or four distinct "horns," and the varieties gradually increase in the number, and vary in the forms of those elevations until they are lost in two ridges passing from the beaks to the posterior basal margin. It is exceedingly interesting to trace these gradual changes of form; and to illustrate the fact of the anomalous varieties being of the same species, I have arranged forty-three specimens in my cabinet, no two of which are alike. Dr Hildreth has made a species of one of these varieties, and calls it *foliatus*. It appears that Mr Barnes and himself had seen only this specimen. I have had three or four in my possession for three years, and at first my impression was in favour of their being new, but examining them with that excellent conchologist, Mr Stewart, we found the line of impression, made by the mantle, did not run parallel with the deep arcuation of the margin, and therefore concluded, at once, that the animal could not conform to the shape of the shell, and consequently that the elongations of the basal and posterior margins were unnatural. Dr H. says he is "unable to determine whether it is a new variety, or only a "lusus naturæ;" and yet he makes a new species of it!! Some of my varieties have the prolongation much more extended than the specimen described by Dr H. In one specimen the unnatural prolongation is more than equal in extent to the natural size of the shell, designated by the impression of the mantle.

* We have been much in the habit of confounding this with the *complanatus*, and considering it as the analogue inhabiting the western waters. It deserves, however, to be retained by Barnes's name, for it possesses characters which the other does not. It is posteriorly more angular, and the shell is subtriangular; the *complanatus* is sub-rhomboidal and more carinate. One inhabits the western; the other the Atlantic rivers. The *cuneatus* is always ponderous; the *complanatus*, I believe, never. Mr B. says his species is never rayed; in this he is mistaken, young and fine specimens have dark broad rays.

† This is undoubtedly the species which we have known under the name of *globosus* (undescribed). Mr B. says "it is more capacious than any of the genus hitherto described." It resembles the *ovatus*, but is always more globose.

22. U. parvus*, Bar.
23. U. æsopus, Green.
24. U. calceolus†, Lea.
25. U. lanceolatus, Lea.
26. U. donaciformis, Lea.
27. U. ellipsis, Lea.
28. U. irroratus, Lea.
29. U. lacrymosus, Lea.
30. U. ater, Lea.
31. U. rubiginosus, Lea.
32. U. heterodon, Lea.
33. U. sulcatus, Lea.
34. U. planulatus, Lea.
35. U. circulus, Lea.
36. U. multiradiatus, Lea.
37. U. occidens, Lea.
38. U. securis, Lea.

---

[*] This is rather the smallest species with which I am acquainted. Barnes says it is " the smallest and most beautiful of all the genus yet discovered in America." In this he alludes to the nacre only, which is more pearly and more brilliant than any species I have seen. The exterior presents nothing peculiar but its concentric waves on the beaks, and a slightly elevated rib passing from the beaks to the posterior margin.

[†] Although I had three specimens of this shell in my possession when I described it, I felt apprehensive it was too closely allied to the Alasmodonta of Say to be considered as an Unio; but as a lamellar plate really existed with an incipient tooth, though small, on each valve, besides the large cardinal tooth, I determined it to be the safest plan to class it with the Uniones. I have recently received larger specimens in which this plate almost entirely disappears, while in younger specimens it is more evident.

39. U. iris, Lea.
40. U. zig-zag, Lea.
41. U. patulus, Lea.

Conchologists have with great reason complained of the extreme difficulty of identifying Lamarck's species of the genus Unio. Mr Barnes says, "In most cases wherever M. Lamarck can find a difference, though by his own account '*nothing remarkable*,' he makes a different species;" and Mr Swainson declares that "one half the species which he has enumerated" cannot be determined on account of the short descriptions and want of figures. The truth of these remarks I have felt severely whenever I have had occasion to consult this author for the genus; and, with the hope of clearing the path in a measure of those who may follow me, I propose to give here the results of examinations of his species made at different times with much care.

U. sinuata. This is the *Mya margaritifera* of Linnæus and other authors, and to which Barnes's *Alasmodonta arcuata* is the analogue. Mr B. was not aware, when he described it, that it was similar. He has recently, in the reclamation of his Uniones, resigned this species of Alasmodonta. If Mr Say's genus be admitted, we must of course call this type of Lamarck's Unio, *Alasmodonta margaritifera.*

U. elongata. There can scarcely be a doubt but that this is a young shell of the above species.

U. crassidens. It is evident on examination of our author's description of this species and its varieties, and the *crassus* of Say and of Barnes, that all the *ponderous* varieties of our Uniones were brought into these species, neither of which can possibly stand. (See note, page ~~417~~.) 31

U. peruviana. This species embraces the *plicata* of Le Sueur, the *crassus* and *undulatus* of Barnes, the *giganteus* of Dr Mitchill's collection, the *rariplicata* and *crassidens* of Lamarck, and the *undulata* and *dombeyana* of Valenciennes.

As it was described previously by Le Sueur's name "*plicata*," this must take precedence. Its habitat, Peru, I think very doubtful; it most probably came from the United States.

U. rariplicata. This is, no doubt, a variety of the above.

U. purpurata. The *recta* answers to this description in every respect but the habitat. The author "believes" it came from Africa. The shell most probably came from the United States, in which case there could not be a doubt.

U. ligamentina,
U. obliqua,
U. retusa.

The description of these is so imperfect that I cannot identify either of them, although they are all from this country, and the same species most probably in our cabinets. I doubt if either of them should be retained.

U. rarisulcata,
U. coarctata,
U. purpurascens.

These are mere varieties of the *complanatus.*

U. radiata. Our author gives the *Mya radiata* of Gmelin and *U. ochraceus* of Say as synonymes to this species. It cannot be both; for the *ochraceus* is a perfectly distinct species from the *M. radiata*, which, Chemnitz says, comes from the rivers of Malabar. The *radiatus* described by Barnes after Lamarck, and Say's *ochraceus* are distinct species, and I have no doubt the *Mya radiata* of Gmelin is distinct from both. Mr Say's figure, referred to by Mr Barnes (pl. 2, fig. 8, Am. Conch.) as *U. radiata*, is undoubtedly an *ochraceus.* (See note on *U. radiatus.*)

U. brevialis. This shell is pictured by Crouch; it is thick, and resembles the *circulus* of the Ohio, but is larger, less round and radiated. It comes from the Isle of France, and is, no doubt, a distinct species.

U. rhombula,
U. carinifera,
U. georgina,

Are all mere varieties of the *complanatus.*

U. clava. I cannot identify this species. The description is too short. Its habitat is Lake Erie and Nova Scotia, from which circumstance it is most probably in our cabinets under another name.

U. recta. This is the same with Barnes's *prælongus.* The *recta* being described first should be retained.

U. naviformis. This name cannot be retained, as Say had previously described the shell under the name of *cylindricus.*

U. glabrata. The habitat of this species is the Ohio river. The description is too imperfect to identify it, and as the author acknowledges it has "nothing remarkable," we may fairly conclude it to be a variety of some one of the numerous species described, a *cariosus* most probably.

U. nasuta. The author thinks this may be the *nasutus* of Say, but the description answers much better to his own *recta* or Barnes's *gibbosus,* and is no doubt one of those. I do not believe the *nasutus* has ever been found in our western waters*.

U. ovata is the *ovatus* of Say, and inhabits the western waters, not the Susquehanna and Mohawk, as mentioned by Lamarck. Maton and Rackett described a British shell under this name, which I believe to be only a variety of *pictorum.* Those sent me from England by this name were certainly mere varieties of the *pictorum.*

U. rotundata. In most of our cabinets may be found a beautiful shell, which we have thought to be of this species, and have adopted the name. It does not, however, answer to the description in some essential characters, and I have therefore thought proper to describe the American shell, and give it a new name. (See description of *circulus.*) Lamarck gives no habitat. Ours is from the Ohio.

U. littoralis is from the Seine, and is described by Draparnaud, who says it resembles the "*U. margaritifera,*" but is much smaller.

U. semirugata. Description too short to identify it. Has no habitat.

---

* Swainson says, "The *Unio nasuta,* however, of Lamarck, I apprehend, will be found different" from *Unio nasutus* of Say.—*Zool. Illus. Vol. I. pl.* 57.

U. nana. This species is said to inhabit Franche Comté. I do not know if there be a specimen in this country.

Should stand as quoted! →

U. alata is the well known *alatus* of Say, and is herein made the type of a new genus, *Symphynota.*

U. delodonta. Description too short to identify it. Has no habitat.

U. sulcidens. A variety of *complanatus;* and is from the Schuylkill, Pennsylvania.

U. rostrata. The specimens which I received from Europe with this name are only elongated varieties of *pictorum.*

U. pictorum. This is a well known species, and described by Linnæus and others as *Mya pictorum.*

U. batava. The specimens sent me of this species from Europe appear to be only a variety of the *pictorum.* It is more obtuse*.

U. corrugata. This species can not be identified with any of ours. It comes from the coast of Coromandel, and is, doubtless, a distinct and well characterised species.

U. nodulosa. The habitat of this species is Lake Champlain, and although pictured in the Ency. Meth. I cannot identify it, the drawing being evidently incorrect. Although represented with a lamellar tooth, I should not be surprized if it proved to be a young *Alasmodonta undulata* of Say, as it has the strong character on the beaks.

U. varicosa. I can only assimilate this with the *Alasmodonta undulata* of Say. Its habitat is the Schuylkill and Lake Champlain.

U. granosa. This is a beautiful and distinct species. Habitat Guyana.

U. depressa. Habitat New Holland. The description is very imperfect, but the species nevertheless distinct. It is a very different shell from that called *depressa* by Rafinesque, who does not seem to have known that the name was preoccupied by Lamarck.

---

* The *U. anas* I believe to be a variety of *pictorum* very similar to this. My specimen is certainly such. The *U. tumida*, from the north of Europe, appears to me to be only a large and thick *pictorum.*

U. virginiana. This, doubtless, is the *radiatus* described by Barnes. Habitat Virginia.

U. luteola is a variety of Say's *cariosus.* Habitat Susquehanna and Mohawk.

U. marginalis. I have specimens of this species from Bengal. It is well characterised, although it does not always possess the marginal character as described by Lamarck and represented in the Ency. Meth. pl. 247.

U. angusta. This I believe to be a variety of *pictorum.* The figure referred to in Lister is certainly a *pictorum*, and is generally quoted as such. Habitat unknown.

U. manca. This may be a distinct species, but I strongly suspect it to be only a variety of *pictorum.* Habitat Bourgogne.

U. cariosa is the *cariosus* of Say.

U. spuria. I cannot identify this species with any of ours. Habitat . . . . .

U. australis. This, like the above, is not identified. Habitat New Holland.

U. anodontina. Habitat Virginia. We have no Unio of this description in our waters. It is probably *Anodonta undulata* of Say, which has sometimes small elevations somewhat similar to teeth*.

U. suborbiculata. I cannot identify this species.

In passing criticisms upon the species of the genus Unio of this great naturalist, I do not in the least wish to detract from his great and merited fame. My object is expressly to endeavour to facilitate the study of this interesting genus, and to remove, as far as I have it in my power, the confusion which has crept into it. My observations I wish to pass only for what they may prove to be worth.

---

* Since writing the above, I observe that Sowerby on the Lamarckian *Naïades* (Zoolog. Journ. Vol. I. p. 54.) gives the "*Anodon rugosus*" of Swainson as the synonyme of *U. anodontina.* It is well known to our conchologists that Swainson's *rugosus* is the old shell of Say's *Anodonta undulata*, which was described from a young specimen, and has priority to the *rugosus.*

---

7. UNIO ATER. Plate VII. fig. 9.

Testâ ovatâ, inæquilaterali, transversâ, ventricosissimâ; umbonibus elevatis; natibus prominulis; epidermide rugosâ nigrâque; umbonibus elevatis; dentibus cardinalibus erectis, cristatis, lateralibus granulatis, rectisque; margaritâ roseâ.

Shell inequilateral, ovate, transverse, much inflated; umbones elevated; beaks slightly prominent; epidermis black and wrinkled; cardinal teeth erect and crestlike, lateral granulated and straight; nacre rose colour.

Hab. Mississippi below Natchez. T. W. Robeson.
My Cabinet.
Cabinet of Prof. Vanuxem.

Diam. 2·6, Length 3, Breadth 4·5 inches.

Shell very ventricose; margin ovate, wider behind, slightly emarginate at base, and sometimes slightly truncate at posterior margin; substance of the shell thick; beaks slightly projecting and decorticated; ligament large; epidermis black or blackish, and wrinkled transversely; cardinal teeth erect, crestlike, and double in both valves; lateral tooth curved, long, deeply divided and slightly serrate, the interior division emerging from the cavity of the beak; posterior cicatrices confluent, anterior cicatrices very distinct; dorsal cicatrices pass across the cavity of the beaks in a row*; cavity of the shell great; nacre pink and iridescent in the posterior margin.

Remarks.—This shell is remarkable for the colour of its epidermis and nacre. The perpendicular distance from the cardinal tooth to the basal margin is very small, while that from the posterior end of the lamellar tooth to the same margin is unusually great. It slightly approaches in form to some varieties of the *cariosus.*

---

* In a former paper of this volume, (page 262) I described the attaching muscles of the back of the animal, the impressions of which in the shell I propose to call *dorsal cicatrices.*

8. Unio Rubiginosus. Plate VIII. fig. 10.

Testâ inæquilaterali, transversâ, postice sub-biangulari, antice rotundatâ; valvulis sub-crassis; natibus prominentibus, recurvis, postice sub-angulatis; dente cardinali magno, laterali crasso; margaritâ salmonis colore.

Shell inequilateral, transverse, sub-biangular behind and rounded before; valves somewhat thick; beaks prominent, recurved, sub-angulated behind; cardinal tooth large; lateral tooth thick; nacre salmon coloured.

Hab. Ohio.

My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of the Academy of Natural Sciences.

Diam. 1·2, Length 2·1, Breadth 2·6 inches.

Shell somewhat ventricose; substance of the shell somewhat thick; umbones slightly elevated; beaks recurved, seldom decorticated, almost touching, whitish, possessing several concentric undulations, which are lost along the umbonial slope, which is carinate; a small curved elevated line passes from the point of the beaks to the margin above the posterior margin; ligament rather large passing from the points of the beaks; dorsal margin oblique; posterior dorsal margin carinate and slightly emarginate; posterior margin angular; posterior basal margin very slightly curved; basal, anterior and anterior dorsal and basal margins rounded; epidermis colour of rust, sometimes salmon yellow, slightly wrinkled and showing the marks of growth; rays in young specimens perceptible; cardinal tooth sulcate, broad and not elevated, often single in both valves; the tooth in the left valve closing in a cavity which sinks almost into the cavity of the beaks of the right valve; lateral teeth rather thick, elevated, straight, generally double in both valves; in the left valve the upper division is less elevated and shorter; anterior and posterior cicatrices both distinct; the smaller posterior cicatrix is situated against the side of the lamellar tooth, near its termination; the anterior adductor muscle makes a cicatrix also against the end of the cardinal tooth; dorsal cicatrices under the cardinal tooth perceptible; cavity of the beaks deep and rounded; nacre always more or less salmon colour; slightly iridescent at posterior margin; whitish on the margin near the adductor muscles.

Remarks.—This is a very distinct species. In its general form it approaches nearest to the *securis*, which, however, is always white in the nacre, and peculiarly rayed. It is peculiar in its reddish brown epidermis, which colour is caused by the salmon nacre showing through it. The character of the cardinal tooth is very peculiar, having a tendency to be single in both valves, while the lamellar tooth is quite equally disposed to be double. All the specimens which I have seen are salmon colour in the nacre. If this should prove universally so, it is the only species which we know to be constantly of that colour.

9. UNIO HETERODON. Plate VIII. fig. 11.

Testâ rhomboido-ovatâ, inæquilaterali, ventricosâ; valvulis tenuibus; dentibus cardinalibus compressis, latis; dentibus lateralibus sub-curvatis, dente laterali valvulæ dextræ, duplici; natibus prominentibus; ligamento sub-brevi; margaritâ albâ.

Shell rhomboidal-ovate, inequilateral, ventricose; valves thin; cardinal teeth compressed, wide; lateral teeth slightly curved, the *double tooth in the right valve*; beaks prominent; ligament rather short; nacre white.

Hab. Schuylkill and Derby Creek, Pa.
My Cabinet.
Cabinet of Mr Mason.
Cabinet of Prof. Vanuxem.
Cabinet of Dr Griffith.

Cabinet of the Academy of Natural Sciences.
Cabinet of Mr Hyde.
Cabinet of Mr Phillips.
Cabinet of Mr Conrad.

Diam. ·5, Length ·9, Breadth 1·5 inches.

Shell rhomboidal-ovate, inequilateral, ventricose; substance of the shell thin; beaks prominent, subcarinate posteriorly, eroded, undulated; ligament rather short; epidermis greenish brown, with oblique obscure rays, wrinkled; dorsal margin rectilinear; posterior dorsal margin obtusely angular; posterior margin acutely angular; basal margin slightly curved; anterior, anterior basal and dorsal margins rounded; cardinal tooth in left valve compressed, wide, reaching beyond the cavity of the beaks, double cleft; in right valve one elevated recurved tooth, which clasps the side of the opposing one; lateral tooth curved, short in left valve, and long in the right, *in which it is double;* anterior cicatrices confluent, as are also the posterior; dorsal cicatrices situated on the under part of the cardinal tooth, scarcely perceptible; cavity of the beaks large; nacre white.

Remarks.—This remarkable species was first observed by Mr Mason and Mr Hyde. To the kindness of the former I am indebted for the use of the fine large specimen figured. It is very curious in the whole apparatus of the hinge, the teeth of which resemble in some measure the *Symphynota compressa,* herein described. From the anterior end of the cardinal tooth to the posterior end of the lateral, the distance is the same in both valves, but in the left valve the cardinal tooth is longest, while in the right valve the lateral tooth is longest. The peculiar character of this shell is in the *double* lateral tooth being in the right valve, in which it differs from all the species yet described. It most resembles in general form the *Alasmodonta** *marginata* of

---

* Mr Say published his description of the genus *Alasmodonta* in the Journal of the Academy of Natural Sciences of Philadelphia, 1818, without knowing, it is to

Say; and some of the younger and more ventricose specimens assume the appearance of the *U. triangularis.*

10. Unio Sulcatus. Plate VIII. fig. 12.

Testâ sub-ellipticâ, inæquilaterali, ventricosâ, sub-emarginatâ; valvulis crassis; natibus fere terminalibus; dentibus cardinalibus lateralibusque magnis, et duplicibus in valvulis ambabus; margaritâ purpureâ.

Shell sub-elliptical, inequilateral, ventricose, slightly emarginate; valves thick; beaks nearly terminal; cardinal and lateral teeth large, and double in both valves; nacre purple.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of the Academy of Natural Sciences.

Diam. 1·3, Length 1·7. Breadth 2·3 inches.

Shell very thick, ventricose, inequilateral, obliquely longitudinal; margin sub-elliptical, with an emargination of posterior basal margin, caused by a broad furrow running from the beaks to this part of the margin; substance of the shell thick and ponderous; beaks thick and projecting beyond the margin, nearly terminal, decorticated; ligament partly concealed by the beaks; epidermis olive-brown, wrinkled, with numerous fine hair like lines, which are slightly undulated, passing from the beaks to the margin; these lines are obsolete in the anterior part of the shell, and crowded in the furrow, over the umbonial slope they are proximate; cardinal tooth elevated, conico-triangular, that in left valve deeply divided; lateral tooth long, thick, and slightly curved, direction nearly

---

be presumed, that the *Mya margaritifera* of Linnæus was in 1817 erected into a new genus by Schumacher, under the name of *Margaritana.* If the absence of the lateral tooth be sufficient to establish the genus, we must necessarily call it by the Danish naturalist's name.

same as cardinal tooth; posterior cicatrices distinct, the smaller one being placed immediately over the large one, and against the lateral tooth; anterior cicatrices distinct; dorsal cicatrices situated on the under part of the cardinal tooth, very perceptible; cavity of the beaks small; nacre flesh-red, varying from this to nearly white; iridescent in the posterior margin.

Remarks.—This is variety *a* of *U. ellipsis*, described in a former paper, and approaches it closely. Having seen several specimens since that description was made, my doubts have been satisfied, and I now consider it a new species. It differs from the *ellipsis* in having the furrow, in being generally covered with fine hair-like rays, and in being always more or less flesh-red inside. I have two specimens of this species which present a singular formation of the posterior basal margin, which is dentate, the points interlocking and almost hooked. The elevation anterior to the furrow commences to swell one-third of the distance from the margin to the beaks, increases as it approaches the margin, and assumes this dentation, which being successive as the shell increases displays laminæ of these dentations in the epidermis. In the interior this part of the shell has the appearance of having been gouged out. It is exceedingly curious, being the only specimen of fluviatile shells I have seen with a margin approaching to a dentate appearance.

11. UNIO PLANULATUS. Plate IX. fig. 13.

Testâ inæquilaterali, ovato-ellipticâ, transversâ; complanatâ per umbones à natibus usque ad marginem inferiorem, maculis quadratis radiatim pictâ; natibus prominulis; dente cardinali parvo, laterali magno, crasso, curvato; margaritâ sub-cœruleo-albâ.

Shell inequilateral, ovate-elliptical, transverse, flattened across the umbones from the beaks to the basal margin, marked with square spots in form of rays; valves thick; beaks slightly prominent; cardinal tooth small; lateral tooth large, thick and curved; nacre bluish white.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of the Academy of Natural Sciences.

Diam. ·8, Length 1·3, Breadth 2·2 inches.

Shell ovate-elliptical, remarkably flattened over the umbones from the beak to the basal margin, which frequently causes the greatest diameter to be near to the anterior margin; substance of the shell thick; beaks slightly prominent and decorticated; ligament deeply seated, scarcely appearing above the margin of the shell; epidermis wrinkled, yellowish brown, with transversely interrupted rays passing from the beaks in a slight curve to the margin along the umbonial slope; these rays are hair like, undulated, and interrupted; cardinal teeth very small and lobed; lateral tooth remarkably thick and situated on a large massive plate; curve very slight and directed much over the cardinal tooth, somewhat rough, upper division smaller than the lower; anterior and posterior cicatrices both distinct; the smaller posterior cicatrix is situated against the end of the plate at the point of the division of the tooth; dorsal cicatrices situated on the under part of the cardinal tooth, perceptible; cavity of the shell very small and irregularly waved; an indistinct depressed line may always be seen to pass from the great posterior cicatrix along the base of the lateral tooth into the cavity of the beaks; nacre white.

Remarks.—This shell is peculiar in the massive plate on which is situated its short and thick lateral tooth, as well as in the very small size of its cardinal tooth. It has scarcely any cavity under the beaks, the shell being very thick. Its epidermal rays, in perfect specimens, are very unusual to this genus; in old specimens they are almost or quite obsolete. It is remarkable also in its flat umbones. It resembles most in form the *gibbosus* of Barnes, but is less rostrated and more thick. The *gibbosus* is seldom if ever perfectly white; all the specimens I have seen of this are perfectly so.

---

12. Unio Circulus. Plate IX. fig. 14.

Testâ circulari, ventricosâ, sub-æquilaterali; valvulis crassis; natibus prominulis; dentibus cardinalibus lateralibusque magnis; ligamento brevi crassoque; margaritâ albâ et iridescente.

Shell circular, ventricose, nearly equilateral; valves thick; beaks slightly elevated; cardinal and lateral teeth large; ligament, short and thick; nacre pearly white and iridescent.

Hab. { Ohio at Cincinnati. T. G. Lea.
Monongahela at Pittsburg. T. Bakewell.
Tennessee at Nashville. Prof. Vanuxem.

My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of Dr Griffith.
Cabinet of W. Hyde.
Cabinet of W. Mason.
Cabinet of J. Phillips.
Cabinet of the Academy of Natural Sciences.
Cabinet of Peale's Museum.
&c.

Unio rotundata? Lamarck.

Diam. 1, Length 1·5, Breadth 1·5 inches.

Shell round; posterior basal margin sometimes very slightly emarginate, very ventricose, transversely wrinkled, nearly equilateral; substance of the shell thick; beaks elevated, medial, and somewhat recurved; epidermis finely wrinkled, shining, satin-like, anterior to the umbonial slope dark brown, posterior light yellow brown; cardinal teeth oblique, thick, and disposed to be treble in both valves; lateral teeth short and thick, disposed to be double in right valve as well as left;

Anterior cicatrices distinct; posterior cicatrices also distinct; the smaller one being placed against the termination of the lateral tooth; dorsal cicatrices situated on the under part of the cardinal tooth, very perceptible; cavity of the beaks deep and sub-angular; nacre white, pearly, and iridescent, rarely tinted with rose in the centre.

Remarks.—This beautiful little shell is generally an inch long, rarely two. It is common in our cabinets, and has been considered the "*rotundata*" of Lamarck. I am induced, however, to think it different from our shell, as the *circulus* never possesses the fold mentioned in that eminent conchologist's very short description. The two colours disposed in so peculiar a manner in the epidermis are not mentioned by him. It differs also greatly in size. I have seen some hundreds, the largest of which was two inches in breadth. The "*rotundata*" is 78 millimetres; and its habitat is unknown.

The margin of the *circulus* is more perfectly round than any other species; it is sometimes disposed to be subangular posteriorly. The division of the colour on the umbonial slope is very peculiar. When the posterior slope is looked on, this view of the shell is heart shaped, and the dark brown colour is seen entirely to surround the light yellow brown. The epidermis is more satin-like than any other species, and the teeth are peculiarly disposed to be double. In form it approaches the "*torsa*" more closely than any other species.

13. UNIO MULTI-RADIATUS. Plate IX. fig. 15.

Testâ ellipticâ, inæquilaterali, ventricosâ, multi-radiatâ; valvulis tenuibus; natibus prominulis; dentibus cardinalibus erectis, et in valvulis ambabus duplicibus; lateralibus lamelliformibus et abruptis; margaritâ cœruleo-albâ.

Shell elliptical, inequilateral, ventricose, much rayed; valves thin; beaks rather prominent; cardinal teeth erect and double in both valves; lateral teeth lamelliform and abrupt; nacre bluish white.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.

Diam. ·8, Length 1.3, Breadth 2 inches.

Shell elliptical, inequilateral, ventricose; substance of the shell thin, the rays being very visible through the nacre; beaks prominent and slightly undulated; epidermis bright olive yellow, with numerous green rays passing from the beaks to every part of the margin; slightly wrinkled, smooth and glossy; cardinal tooth double in both valves and deeply cleft; lateral tooth lamelliform, nearly straight, higher near the termination, termination abrupt; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under part of the cardinal tooth, and within the margin of the cavity of the beaks; cavity of the beaks large and rounded; nacre pearly white and iridescent, thin, showing the rays very distinctly through it, and presenting a wide margin.

Remarks.—This beautiful shell resembles most the young *cariosus* of the Ohio and other western waters. It differs, however, in being much less ponderous, possessing more minute rays, being rather more ventricose, having more elevated teeth and more prominent beaks.

14. UNIO OCCIDENS. Plate X. fig. 16.

Testâ sub-ellipticâ, inæquilaterali, transversâ, ventricosâ; valvulis crassis; natibus sub-undulatis, raro decorticatis; ligamento sub-brevi crassoque; dentibus elevatis; margaritâ albâ.

Shell inequilateral, sub-elliptical, transverse, ventricose; valves thick; beaks slightly undulated, rarely decorticated; ligament rather short and thick; teeth elevated; nacre white.

Hab. Ohio. T. G. Lea.
My Cabinet.

Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of the Academy of Natural Sciences.
Cabinet of Peale's Museum.

Diam. 1·6, Length 2·3, Breadth 3·4 inches.

Shell ovate, inequilateral, sub-elliptical, transverse, very ventricose; substance of the shell somewhat thick; beaks large, prominent, rounded, approaching, slightly undulated, rarely decorticated; ligament short and thick; epidermis slightly wrinkled, shining, olive yellow, with green rays passing obliquely from the beaks to the margin, most numerous on the posterior slope; cardinal teeth double and very prominent in both valves; in the left valve the cleft is deep and both prongs rake much, the outer most elevated; in the right valve the cleft is also deep, and the inner prong is broad, flat, curved, and most elevated; lateral teeth short and very lamelliform, the termination declining rather suddenly; anterior cicatrices generally distinct; posterior cicatrices confluent; dorsal cicatrices very perceptible, the line commencing with quite a large one on the under side of the callus between the lateral and cardinal teeth, and terminating at the outer part of the base of the cardinal tooth; marginal cicatrix very perceptible; cavity of the beaks deep, large and rounded; nacre milk white, rarely iridescent.

Remarks.—The specimen figured is the finest I have ever seen of this species, and, taking it altogether, perhaps of any other of the genus. The rays are very remarkably fine, and the nacre is purer and whiter than the finest porcelain. It is very frequently, however, found with few or no rays, and the nacre, though milk-white and pure generally, is not always so. The double, deeply cleft, cardinal tooth of both valves, and the raking position of that of the left valve are peculiar to the species possessing this general form, which includes the *ovatus* and *ventricosus*. It seems to form the link between these two. It differs from the *ovatus* in not possessing the flat posterior slope, and from the *ventricosus* in not being globose over the umbones; and of course is much less in diameter. The quite large impression of the mantle under the callus, between the lateral and cardinal teeth, is very remarkable in these three species.

---

15. Unio Securis. Plate XI. fig. 17.

Testâ subtriangulari, inæquilaterali, per umbones valde complanatâ; valvulis crassis; natibus elevatis, recurvatis, compressissimisque; dente cardinali magno, laterali crasso; ligamento breviusculo, crassoque; margaritâ albâ et iridescente.

Shell sub-triangular, inequilateral, flattened over the umbones; valves thick; beaks elevated, recurved, much compressed; cardinal tooth large; lateral tooth thick; ligament rather short and thick; nacre pearly white and iridescent.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of the Academy of Natural Sciences.
Unio depressa of Rafinesque.

Diam. ·9, Length 1·5, Breadth 1·9 inches.

Shell sub-triangular, transversely wrinkled, inequilateral, much flattened over the umbones; substance of the shell thick, often ponderous; beaks elevated, much compressed, recurved; dorsal margin angular; posterior dorsal margin oblique; posterior margin angular; basal and posterior basal margin curved; anterior and anterior basal and dorsal margins round; posterior slope flattened, this view presents the shell as a long ellipsis; epidermis olive-yellow passing into olive-brown, shining and transversely wrinkled; rays formed by small spots, alternately darker and lighter than the general colour of the epidermis, which cause the rays to look like a minute chain, these rays are from one to two eighths of an inch apart, and extend over the whole disk, the spaces between are supplied with numerous hair-like lines, the whole passing in a curve from the beak to the margin; cardinal tooth large, irregularly cleft and sulcated; lateral tooth rather short and thick, in the right valve disposed to be double; anterior cicatrices distinct; posterior cicatrices also distinct, the small one being placed against the termination of the lateral tooth; dorsal cicatrices situated on the under side of the cardinal tooth; cavity of the beaks shallow and rounded; cavity of the disk small; nacre pearly white and iridescent.

Remarks.—Mr Rafinesque first observed this singular and interesting species. He found a single specimen near Evamville, Indiana, and described it under the name of *U. depressa*, which name being preoccupied by Lamarck, I have considered it incumbent on me to give it a new name. Many specimens have come under my inspection, and the shell being a very remarkable one, I am induced, in consequence of Mr Rafinesque's short description and imperfect figure, to give a more full description and a correct figure. It is altogether peculiar in its rays and its very compressed beaks; no species is so flat over the umbones, and no other species presents, when the posterior slope is held towards the observer, a long ellipsis, the widest part of which is about the centre. In consequence of the beaks being so very much compressed, the junior, when not more than an inch long, is *exceedingly* flat, and the cavity proportionally small. When the shell increases beyond this it seems to become suddenly thick, and its form becomes more rounded towards the margins, consequently the adult is very different in form from the junior, which might easily be mistaken for another species. It is more generally gaping at the anterior margin than the other species. It assimilates closely to the *planulatus* (described in this paper), but differs in the rays, the much compressed beaks, and being more hatchet shape. In the last character it resembles somewhat the *rubiginosus* described in this paper. It sometimes occurs twice the size of the one represented here.

16. Unio Iris. Plate XI. fig. 18.

Testâ angusto-ellipticâ, inæquilaterali, sub-ventricosâ; valvulis tenuibus; natibus prominulis; dente cardinali in valvulâ sinistrâ, duplici, in dextrâ sub-bifido, parvo, erecto; dentibus lateralibus longis tenuibusque; margaritâ sub-cœruleo-albâ.

Shell narrow-elliptical, inequilateral, slightly ventricose; valves thin, beaks slightly prominent; cardinal teeth double in the left valve, subbifid in the right, small, erect; lateral teeth long and thin; nacre bluish white.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.

Diam. ·5, Length ·8, Breadth 1·6 inches.

Shell long-elliptical, inequilateral, slightly ventricose; substance of the shell thin, showing the rays through it, rather more dense before than behind; beaks slightly prominent, approaching, crowned with double concentric undulations when they are not decorticated; ligament rather long and thin; epidermis yellowish green, transversely wrinkled, marked with many oblique diverging rays passing from the beaks to the margin; cardinal teeth double in both valves, small, erect, and sharp; lateral teeth long, bladed, slightly curved and situated on the edge of the margin in contact with the ligament; anterior cicatrices distinct; posterior cicatrices confluent and scarcely perceptible; dorsal cicatrices within the cavity of the beaks, the largest on the under part of the callus; nacre very thin, milk white anteriorly, bluish white and iridescent posteriorly.

Remarks.—This species most resembles the *calceolus*. It differs, however, entirely in the teeth, which are distinct and well defined. The *calceolus* approaches closely to the genus *Alasmodonta* of Say. This is less ventricose and possesses more rays.

17. Unio Zig-zag. Plate XII. fig. 19.

Testâ ovatâ, inæquilaterali, ventricosâ; valvulis sub-crassis; dentibus cardinalibus magnis, erectis; lateralibus curvatis; natibus prominulis; radiis ex lineis angulatis compositis; ligamento brevi crassoque; margaritâ albâ.

Shell ovate, inequilateral, ventricose; valves rather thick; cardinal teeth large, erect; lateral teeth curved; beaks rather prominent; rays composed of zig-zag lines; ligament short and thick; nacre pearly white.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of the Academy of Natural Sciences.
Cabinet of Peale's Museum.

Diam. ·6, Length ·9, Breadth 1·5 inches.

Shell ovate, inequilateral, ventricose; substance of the shell thick; beaks rather prominent, subcarinate posteriorly, generally eroded; ligament short and thick; epidermis yellow in ground, but traversed by oblique green rays, which give it sometimes a dark hue; these rays pass from the beaks to the margin over the whole disk, and are formed by zig-zag lines, which in some specimens are joined so closely as to become confluent; on the posterior slope are irregular lines converging below the ligament; cardinal teeth large, deeply divided in the left valve; lateral teeth slightly curved; anterior cicatrices distinct, as are also the posterior, the smaller of which is placed against the side of the lateral tooth at its termination; dorsal cicatrices situated along the base of the cardinal tooth within the cavity of the beaks; cavity of the beaks shallow; nacre pearly white and iridescent.

Remarks.—This beautiful little shell is about the size of Barnes's *parvus*. It is however entirely distinct from it. It is much heavier, more ovate, and radiated; has no concentric undulations at the beaks like the *parvus*, which character Mr

Barnes does not mention, and is yellowish, not brownish. This and the *donaciformis* are all I know which possess the zig-zag markings, and they most resemble each other.

---

18. Unio Patulus. Plate XII. fig. 20.

Testâ ovatâ, compressâ, cuneiformi, inæquilaterali, obliquâ, transversâ; umbonibus compressis; valvulis sub-crassis; natibus sub-terminalibus; dente cardinali parvo; laterali longo et sub-curvato; margaritâ albâ.

Shell ovate, compressed, wedge-shaped, inequilateral, oblique, transverse, compressed on the umbones; valves rather thick; beaks nearly terminal; cardinal tooth small; lateral tooth long and slightly curved; nacre pearly white.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.

Diam. ·8, Length 1·4, Breadth 2·3 inches.

Shell compressed, wedge-shaped, ovate, broad and flat; substance of the shell thick anteriorly and thin posteriorly, showing the rays through it; beaks nearly terminal, slightly prominent, approaching, and when perfect possessing slight concentric undulations, generally decorticated; ligament not large, passing from the point of the beaks; epidermis yellowish brown, transversely wrinkled, marked with more or less broad interrupted rays, apparently formed of fasciculi of hair-like lines; cardinal tooth short, and but slightly elevated, in the left valve double and deeply cleft, in the right valve emerging from a pit; lateral tooth long and slightly curved; posterior cicatrices as well as anterior cicatrices distinct; the smaller posterior cicatrix situated against the lateral tooth at its termination; dorsal cicatrices on the under part of the cardinal tooth; cavity of the beaks not deep but rounded; nacre thick and milk white anteriorly, thin and iridescent posteriorly.

Remarks.—This species approaches closely to the *scalenia* of Rafinesque; its rays are of the same description, and the general form is the same. It is, however, more flattened, has much less elevated beaks, and its diameter is always much less. Its beaks are generally but little decorticated, and not recurved; the *scalenia* is generally much recurved and decorticated.

GENUS SYMPHYNOTA.

Testâ fluviatili, bivalvi; valvulis superné connatis.

Shell fluviatile, bivalve; valves connate at the dorsal margin.

Animal same as that of Unio.

Remarks.—Objections will most likely be made to the introduction of a new genus into a family acknowledged already to be in great confusion, and presenting many and various difficulties. The formation of the genus *Symphynota*, it is hoped, will rather be conducive to a diminution of that difficulty, by a division which all must acknowledge to be as natural as any of those of the family. The distinctive characteristic of this genus is the testaceous connection of the two valves of the shell above the hinge. I therefore remove from the existing genera all the connate shells without regard to the forms of their teeth, believing, that should this family be hereafter remodelled, it will present only two natural genera; one having a testaceous connection of the valves, the other dispossessed of it. The difficulties attending the adopted genera of the *Naïades*, viz. *Unio* of Bruguière, *Hyria*, *Anadonta*, *Iridina*, *Castalia** of Lamarck, *Dipsas* of Leach, and

---

* This genus was placed by Lamarck in the family *Trigonæa*, certainly with no propriety. It has been placed by Sowerby and Latreille among the *Naïades*,

Alasmodonta of Say, have been mentioned by two eminent English conchologists, W. Swainson and G. B. Sowerby, as well as in America by P. H. Nicklin. Mr Sowerby (Zool. Journ. Vol. I. p. 55.) has reunited them under the name of *Unio*, of which he makes two great divisions: 1. Without teeth. 2. With teeth; and these are each subdivided into "winged" and "not winged;" which are again divided into the various forms of teeth, or the "hinge line." The evident objection to this arrangement is the difficulty of deciding upon the passage from the "not winged" to the "winged." Thus we do not find the *Anodonta trapezialis* and *Anodonta glauca*, which Lamarck describes as "*compresso-alatâ*," mentioned among the "winged," while we have "*Anodon alatus* of Swainson and Lamarck," which is not described in the "Hist. Nat. des Animaux sans Vertebres*."

It is evident that the apparatus for depositing the calcareous and epidermal matter on the elevated and connected wing must be different from that of the inhabitant of free valves, to which it has been denied by nature.

Lamarck and Barnes both mention in their description of the *U. alatus* of Say, that M. Le Sueur thought this shell should constitute a new genus. Since that time so many connate shells have come to my notice, that I feel satisfied the science of conchology will be subserved by the institution of this natural genus, which will embrace, in all probability, several others, viz. *Hyria* of Lamarck, *Dipsas* of Leach, and *Cristaria*, *Prisodon*, and *Paxyodon* of Schumacher, all of which, when they shall be found perfect, will most probably turn out to be connate shells. Lamarck suspected his *Hyria* to be connate, like the *U. alatus;* for when describing that species, he says, "Nos *Hyries* auraient-elles une pareille réunion

and here must be considered as a species of Unio, and not a genus. The observant M. De Blainville has placed *Castalia* and *Hyria* among the *Uniones*, and *Iridina* and *Dipsas* among the *Anadontæ*. *Castalia ambigua* is undoubtedly a fluviatile shell, and approaches most closely to the *U. triangularis*. The teeth are those of the Unio, and it differs only in its longitudinal furrows from the general characters of the Unio.

* Say describes his *An. gibbosa* as being alated.

à la carène de leur corselet?" Indeed the fact can scarcely be doubted.

SPECIES.

1. Symphynota Lævissima. Plate XIII. fig. 23.

Testâ ovato-triangulari, inæquilaterali, transversim rugosâ, sub-ventricosâ; valvulis tenuissimis, superne bi-alatis, ante et post nates connatisque; dentibus cardinalibus et lateralibus lineam curvatam facientibus; natibus prominulis; ligamento celato; margaritâ purpureâ et iridescente.

Shell triangular-ovate, inequilateral, transversely wrinkled, sub-ventricose; valves very thin, elevated into two wings, connate anteriorly and posteriorly to the beaks; cardinal and lateral teeth form a curve line; beaks scarcely prominent; ligament concealed; nacre purple and iridescent.

Hab. Ohio. T. G. Lea.

My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.

Diam. 1·4 inch. Length from beaks to base, 2·4 inches.
Breadth 4·5 inches.
Length from the top of the wing to base, 3·1 inches.

Shell sub-triangular-ovate, inequilateral, sub-ventricose, transversely and very finely wrinkled, shining; substance of the shell thin, but compact; valves elevated into two wings, neither of them very high, the posterior one larger than the anterior, both connate; beaks scarcely prominent, termination pointed, and when not decorticated exhibit two or three very minute elevations, almost requiring a microscope to discover them; the purple nacre shows through the epidermis here, and gives the tips that colour; ligament concealed in the wing; sinus subquadrate; epidermis thin and purple brown; young specimens sometimes possess obscure brown rays; cardinal tooth lamelliform, *single in the left valve and disposed to* *be double in the right;* lateral tooth lamelliform and double in the left valve only, the two teeth form one continuous curve line, somewhat abrupt at both terminations, more so at the anterior one; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices very perceptible. Cavity of the beaks wide and very shallow; nacre purple and iridescent.

Remarks.—This beautiful shell most resembles the *Symphynota alata* in its general form, but its posterior wing is less elevated. The colour of its nacre is the same. It differs entirely, however, in the cardinal tooth, and in possessing the anterior connate wing. A metallic sound is produced by dropping one valve into the other, which is very remarkable, and is caused by the density of the calcareous matter of the nacre, which is very thin. The epidermis is exceedingly smooth and glossy.

---

2. Symphynota Bi-alata. Plate XIV. fig. 24.

Testâ ovato-triangulari, inæquilaterali, transversim rugosâ, sub-ventricosâ; margine dorsali bi-alatâ; valvulis tenuibus, ante et post nates connatis; natibus et alæ posterioris basi apiceque undulatis; natibus haud prominentibus; dente lamelliformi unico in valvulâ utrâque; ligamento celato; margaritâ tenui et iridescente.

Shell triangular-ovate, inequilateral, transversely wrinkled, sub-ventricose; dorsal margin raised into two wings; valves thin, connate before and behind the beaks; beaks and the base and summit of the posterior wing undulated; beaks not prominent; one lamelliform curved tooth in each valve; ligament concealed; nacre thin, pearly, and iridescent.

Hab. . . . . fresh waters of the south of Asia? Brought from Canton by Captain Barr.

My Cabinet.
Cabinet of Mr Pierpoint.
Cabinet of Mr Hyde.
Cabinet of Mr Phillips.

Diam. 1 inch. Length from the beaks to the base, 2 inches.
Breadth 3·6 inches.
Length from the top of wing to base, 3·4 inches.

Shell triangular-ovate, inequilateral, subventricose, transversely and finely wrinkled, shining; substance of the shell thin, showing the rays through it; valves elevated into a broad high wing posterior, and a small one, anterior to the beaks, and connate in both; beautifully undulated at the base and top of the posterior wing; undulations of the base commencing at the point of the beaks, pass on the outside of the tooth to the margin in a slightly curved line, each successive wave increasing in size and cutting the wrinkles of the epidermis obliquely; those of the top of the wing, when it is perfect, are about the same in number, but less elevated, and closer together; they cut the wrinkles at about the same angle; beaks not prominent, crowned with about six elliptical concentric undulations; ligament concealed in the wing; sinus formed by the end of the ligament, sub-quadrate; epidermis yellow and purple brown, with green oblique rays, finely wrinkled, smooth and shining; the wrinkles of the anterior wing, as they ascend the wing, are curved anteriorly and continuous over both wings; each valve furnished with a long, curved, lamelliform tooth, very small anteriorly to the beaks, larger and longer posteriorly, pointed at both ends; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated in the cavity of the beaks, very perceptible; cavity of the beaks wide and very shallow; nacre thin, pearly, and iridescent, with tints of salmon, white and purple; the undulations very perceptible from the centre of the beaks along the base of the tooth to the posterior dorsal margin.

Remarks.—All the specimens which I have seen of this remarkable species were brought from Canton. The first was received by Mr Hyde about two years since, and then excited much interest with our conchologists. Several specimens more perfect were brought last summer in the "Caledonia;" and from these specimens the description has been made. That of Mr Hyde is a large, old, and valuable specimen, but has lost some of its important characters. Both wings are destroyed, the beaks much eroded, and the epidermis black and much wrinkled, and the rays obsolete. The remarkable waves at the base of the posterior wing are almost obsolete, and the beauty of the nacre nearly destroyed by being thick and opake; cicatrices very perceptible. In this specimen, and I believe it will occur in all adult individuals, the only remains of the lamelliform tooth are in the termination of it under the ligament, about an inch long; the rest of it is lost in the callus of the dorsal margin. Its dimensions are

Diam. 2·1, Length 5·5, Breadth 7·1 inches.

In general form and character this species exteriorly resembles most the *Symphynota alata;* interiorly, except in colour, the *Symphynota lævissima,* herein described; the shape of the lamelliform tooth of which assimilates to it, with the exception of its being double. The teeth in both these species describe nearly the same arc and take the same position. Both species are alated anteriorly and posteriorly to the beaks. The *lævissima* differs in having no undulations, and possessing obsolete rays, double teeth, and purple nacre.

The *Dipsas plicatus* of Leach bears a strong resemblance to this shell. It differs, however, in the wings of the *D. plicatus* not being elevated, almost forming a line with the beaks, in the latter not being connate, and in not being crowned with undulations at the beaks. His description, however, is so short and defective, and the drawing evidently so badly executed, that I cannot determine in what other points it may differ.

Schumacher's *Cristaria tuberculata* bears a strong affinity to this species also, as well in his description as his plate. He describes and figures it, however, as being alated posteriorly, and not anteriorly, and does not mention its being connate. The fact of its possessing a divided lateral tooth, "callus parallelus bifidus," proves that it is not our species.

3. SYMPHYNOTA ALATA.

Testâ ovato-triangulari, transversim rugosâ, sub-compressâ; valvulis crassiusculis, earum marginibus dorsalibus alatis, et super ligamento connatis; dente cardinali in valvulis ambabus duplici, laterali in sinistrâ tantum duplici, subcurvato; ligamento sub alâ celato; natibus prominulis; margaritâ purpureâ.

Shell triangular-ovate, transversely wrinkled, rather compressed; valves moderately thick, elevated into a high wing, and connate over the ligament; beaks scarcely prominent; cardinal tooth double in both valves; lateral tooth double in the left valve only, and slightly curved; ligament concealed; nacre purple.

Hab. our western waters.

Unio alatus. Say. Nicholson's Encyclopædia (Am. Ed.) Art. Am. Conch. pl. 4, fig. 2.*

Unio alata. Lamarck.

Unio alatus. Barnes. Silliman's Am. Journ. Vol. VI.

Unio alata. Swainson.

Diam. 2, Length 4·7, Breadth, 6·9 inches.†

Remarks.—In young specimens it appears disposed to be connate anteriorly to the beaks also. The dorsal cicatrices form quite a row across the cavity.

4. SYMPHYNOTA COMPLANATA.

Testâ ovato-triangulari, inæquilaterali, transversim rugosâ, compressâ; valvulis crassis; margine posteriori dorsali alatâ connatâque; dente unico cardinali in valvulâ utrâque; plano irregulari calloso sub ligamento; natibus compressis, sub-prominulis; ligamento celato; margaritâ albâ, iridescenti.

Shell triangular-ovate,‡ inequilateral, transversely wrinkled, compressed; valves thick; posterior dorsal margin winged and connate; a large cardinal tooth in each valve; an irregular callous plane under the ligament; beaks compressed and scarcely projecting; ligament concealed; nacre white and iridescent.

---

* This figure was made from an imperfect specimen, the wing being mutilated.

† See Barnes's description.

‡ Mr Barnes says "ovately quadrangular;" but the shell is evidently more triangular, as his figure displays it. *See Silliman's Am. Journ. Vol. VI. p.* 278.

Hab. { Fox River. Mr Schoolcraft.
Wisconsan. Captain Douglass.
Ohio. W. Cooper. }
My Cabinet.
Cabinet of Mr Barnes.
Cabinet of Prof. Vanuxem.
Cabinet of the New York Lyceum.
Cabinet of Dr Mitchill.
Cabinet of the Academy of Natural Sciences.
Alasmodonta complanata. Barnes.

Diam. ·9—1·4 inches. Length from beaks to base, 3 inches.
Breadth 5 inches.
Length from the top of the wing, 4·3—4·5 inches.*

Shell triangular-ovate, inequilateral, transversely wrinkled, compressed, the largest diameter being nearly 2-3ds of the distance from the beaks to the base; substance of the shell thick; valves elevated into a moderately sized wing over the ligament, and connate; this wing is traversed at right angles to the wrinkles, by obscure undulations reaching to the beaks; beaks much compressed and scarcely projecting, crowned by several double concentric undulations, which terminate in a point; ligament concealed in the wing; sinus subquadrate; epidermis dark brown and irregularly wrinkled; cardinal tooth thick, elevated, sulcated, and diverging from the beaks; a wide, irregular callous plane extends under the ligament; cicatrices in the anterior margin three, and irregular; in the posterior margin two, confluent and scarcely perceptible; dorsal cicatrices very perceptible; cavity of the beaks and disk small; nacre white and iridescent.

Remarks.—This shell, first described by Barnes, is a rare and beautiful species. It is peculiar in its very much compressed beaks, and in its greatest diameter being but a short distance above the basal margin.

---

* See Barnes's description; my specimen is rather more ventricose.

---

5. Symphynota Compressa. Plate XII. fig. 22.

Testâ transversim elongatâ, inæquilaterali, valde compressâ, ellipticâ; valvulis tenuibus; natibus sub-prominulis, undulatis; dente cardinali prominente; laterali parvo.

Shell transversely elongated, inequilateral, compressed, elliptical; valves thin; beaks scarcely prominent, undulated; cardinal tooth prominent; lateral tooth small.

Hab. { Ohio. T. G. Lea.
Norman's Kill, near Albany. Dr Eights.

My Cabinet.
Cabinet of Prof. Vanuxem.
Cabinet of Dr Eights.
Cabinet of P. H. Nicklin.
Cabinet of the Academy of Natural Sciences.
Cabinet of the New York Lyceum.

Diam. ·8, Length 1·7, Breadth 2·8 inches.

Shell transverse, much compressed, elliptical; substance of the shell rather thin; beaks slightly elevated, not decorticated, beautifully crowned with small double concentric undulations, points of the beaks almost white; ligament concealed within the valves; dorsal margin rather elevated posteriorly to the beaks; posterior margin sub-angular; posterior basal and basal margins curved; anterior and anterior dorsal and basal margins rounded; epidermis olive-green, slightly wrinkled and glabrous; radiations over the whole disk; cardinal tooth prominent and curved, in the left valve with three protuberances, the posterior the highest, sloping to the end of the lateral tooth, the anterior the lowest; in the right valve one rather large, which closes between the first and second of the left; lateral tooth short and nearly straight, passing from the very point of the beaks, in the right valve lamellar near the termination, and abrupt; in the left acicular, the channel being only large enough to admit of the edge of a penknife; in the right valve the cardinal and lateral teeth are entirely separated by a cavity formed by the tooth of the other valve, this cavity is at the very point of the beak, and therefore the valve has little or no cavity; in the left valve the large recurved tooth forms a beautiful angular cavity; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated at the point of the cavity of the beaks; cavity of the shell very shallow; nacre delicate salmon colour towards the beaks, bluish towards the margin.

Remarks.—This is a singular and beautiful shell. Its cardinal and lateral teeth are very remarkable. The first being high in the left valve over the cavity of the beak, while in the right it is there depressed; the latter is short and lamelliform at termination. The beaks are equally remarkable, being finely undulated; the epidermis is so thin and delicate as to give them almost a white appearance. The rays are broader and more full than in any shell I have seen; they diverge in all directions from the point of the beaks to the margin.

The specimen belonging to the cabinet of the New York Lyceum, was kindly sent for my inspection by W. Cooper, a member of that valuable institution. It was given by Dr Eights to Mr Barnes, and by the latter labelled "*U. alasmodontina.*" My description was written some years since, but remained unpublished until I should have an opportunity of examining other specimens.

6. Symphynota Gracilis.

Testâ sub-triangulari-ovatâ, inæquilaterali, transversim rugosâ, sub-compressâ; valvulis tenuibus fragilibusque; margine posteriori dorsali sub-alatâ, connatâque; dente cardinali in valvulâ dextrâ elevato, recurvo; natibus sub-prominulis; ligamento celato; margaritâ violaceo-purpureâ et iridescente.

Shell sub-triangular-ovate, inequilateral, transversely wrinkled, rather compressed; valves thin and fragile; posterior dorsal margin connate, wing but little elevated; cardinal tooth of right valve elevated, recurved; beaks scarcely prominent; ligament concealed; nacre pearly, violet-purple, and iridescent.

Hab. { Ohio. T. G. Lea.
Wisconsan. Mr Schoolcraft. }
My Cabinet.
Cabinet of Mr Barnes.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of Mr Swainson.
Cabinet of the New York Lyceum.
Cabinet of the Academy of Natural Sciences.

Unio gracilis. Barnes. Silliman's Amer. Journ. Vol. VI. p. 174.

Unio fragilis. Swainson*.

Unio planus. Barnes.

Diam. 1—1·2, Length 2·2—2·5 inches.
Breadth 3·1—4·1 inches†.

Shell sub-triangular-ovate, inequilateral, transversely wrinkled, rather compressed; substance of the shell thin; valves elevated into a small wing over the ligament and connate; beaks slightly prominent, pointed, having two or three minute elevations; ligament concealed in the wing; epidermis yellow-green, finely wrinkled, obscurely radiated and glabrous; marks of growth very perceptible; cardinal tooth of right valve crest-like, recurved, and clasping the side of the opposite one; lateral teeth lamelliform and curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices form a line across the cavity of the beaks, and are very perceptible; cavity of the beaks very wide and shallow; nacre pearly, bluish-white, violet-purple and iridescent.

---

* I have retained the specific name of Mr Barnes in preference to that of Mr Swainson in the right of priority. Mr B. published in January 1823. Mr S.'s dedication of 3d vol. of his Zool. Illus., in which the *fragilis* is described, is dated Oct. 1823.

† See Barnes's description.

Remarks.—Mr Barnes noticed this as a connate shell. His description of the cardinal tooth does not agree with my specimens, except in the younger ones, in which this tooth is more lamellar. The recurved tooth hooking or clasping the other, when the valves are closed, is very remarkable.

In some specimens the lateral and cardinal teeth form an uninterrupted curve line, when the cardinal tooth is quite lamelliform; in others the latter is small and lobed, age producing much effect on it in this respect.

---

7. SYMPHYNOTA TENUISSIMA. Plate XI. fig. 21.

Testâ angusto-ellipticâ, inæquilaterali, transversim rugosâ, compressâ; valvulis tenuissimis fragillimisque; margine dorsali connatâ; dente cardinali prominentiâ exiguâ, laterali unico et aciculari in valvulâ utrâque; natibus depressis; ligamento celato; margaritâ cæruleo-albâ et purpureâ, iridescente.

Shell narrow-elliptical, inequilateral, transversely wrinkled, compressed; valves very thin and very fragile; dorsal margin connate; cardinal tooth a small lobe; lateral tooth acicular and single in both valves; beaks depressed; ligament concealed; nacre bluish-white and purple, iridescent.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.

Diam. ·6, Length 2·2, Breadth 2·5 inches.

Shell narrow-elliptical, inequilateral, transversely wrinkled, much compressed; substance of the shell very thin; valves connate over the ligament, and not elevated into a wing; beaks scarcely prominent, pointed, nearly terminal; epidermis wrinkled, yellow, with very oblique green rays, which, when apparent, give a greenish hue to the shell; rays more numerous and perceptible along the umbonial slope; marks of growth very perceptible; greatest diameter along the umbonial slope; cardinal tooth of right valve a small lobe closing into a depression of the margin of the left valve; lateral teeth acicular, single in both valves, and nearly or quite direct; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices form a line across the cavity of the beaks, and are very perceptible; cavity of the beaks scarcely apparent; nacre bluish-white, purple about the region of the teeth and the cavity of the beaks.

Remarks.—This interesting species is the most fragile and thin of all the family of the *Naïades* which I have seen. The epidermis seems in some specimens to prevail over the substance of the shell, which is so extremely brittle as almost to be destroyed in our cabinets by its contraction from the effect of the atmosphere. The beaks are so nearly terminal that it somewhat resembles the *modiola* in this respect. It is the nearest approach to the *Anodonta*, having but the rudiments of teeth; and I am much disposed to believe that the "*Anodon purpurascens*" of Swainson is analogous to this shell. He had seen but one perfect specimen sent him by Mr Rafinesque from the "back settlements." I have seen many specimens of the *tenuissima*, all of which have the rudiments of the cardinal and lateral teeth. This shell exhibits to us the necessity of resorting to a more natural definite division of *Naïades* than that of the teeth. The *tenuissima* resembles most the *gracilis.* They differ, however, in the latter being much larger, more ovate, heavier, more ventricose, and not radiate. The teeth of the *gracilis* are well defined, which is not the case with this.

8. SYMPHYNOTA OCHRACEA.

Testâ sub-ovatâ, inæquilaterali, transversim rugosâ, inflatâ; valvulis post ligamentum connatis, tenuibus, fragilibus, et sine alâ; dentibus cardinalibus et lateralibus curvam lineam facientibus; natibus prominentibus; ligamento conspicuo; margaritâ cœruleo-albâ et ochraceâ.

Shell sub-ovate, inequilateral, transversely wrinkled, inflated; valves thin and fragile, connate *behind* the ligament, not winged; cardinal and lateral teeth forming a curve line; beaks prominent; ligament visible; nacre bluish-white and ochraceous.

Hab. Schuylkill and Delaware.
My Cabinet.
Cabinet of Mr Say.
Cabinet of Prof. Vanuxem.
Cabinet of Mr Hyde.
Cabinet of the Academy of Natural Sciences.
Cabinet of Dr Griffith.
Cabinet of P. H. Nicklin.
Peale's Museum.

Unio ochraceus. Say. Nicholson's Encyclopædia, Art. Am. Conchol. pl. 2, fig. 8.

Diam. 1·3, Length 1·9, Breadth 2·9 inches.

Shell sub-ovate, inequilateral, transversely wrinkled, inflated; dorsal margin rectilinear; valves thin and fragile, connate *behind* the ligament, not winged; beaks full and prominent, with several concentric undulations; *ligament not concealed;* epidermis glossy, varying from yellow ochre to brown ochre, marked with oblique rays, most abundant behind; cardinal and lateral teeth lamelliform, forming a curve line, in the *right* valve the cardinal tooth is double, in the *left* single; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices form a row across the cavity of the beaks, very perceptible; cavity of the beaks large; nacre bluish-white and ochraceous; along the anterior basal margin thicker and tinged with red; posterior margin iridescent.

Remarks.—This is a beautiful shell. It is remarkable in being connate behind the ligament; this connection, however, is very small, and only perceptible in perfect specimens; in the old ones it is separated. Fine specimens have been in our cabinets for years without our observing they were connate. The cardinal tooth being double in the right valve seems to have escaped the attention of the observant Mr Say.

---

9. SYMPHYNOTA CYGNEA.

Testâ ovatâ, antice latâ et rotundatâ, irregulariter transversim rugosâ; natibus retusis; valvulis tenuibus et post ligamentum connatis.

Shell ovate, wide before and round, with irregular transverse wrinkles; beaks not prominent; valves thin and connate behind the ligament.

Hab. rivers and lakes of Europe.
My Cabinet.
Mytilus cygneus. Lin. Gmel. p. 3555.
Anodonta cygnea. Lam.

Remarks.—It is a matter of surprize to me that this shell, so long known and so often described by European conchologists, should not have been before observed to be connate. It has not to my knowledge been thus described. Among about a dozen specimens received from various parts of Europe, I have two which are decidedly and undoubtedly connate. One was sent to me by Count de Yoldi of Copenhagen, the other by W. Swainson, Esq. of London. These are the only specimens I have seen with the dorsal margin unfractured, and it may be that even in their native beds they rarely exist in a perfect state with regard to this part. Young specimens would be more likely to be found perfect, if taken from pools or lakes where they remain undisturbed by the attrition of sand, &c. carried over them by the action of the water.

In closing this paper, I take the opportunity of returning my thanks to those friends who have kindly loaned me their specimens for examination and comparison, and by whose advice I have frequently profited. To P. H. Nicklin, Esq. I feel under peculiar obligations for frequent consultations and assistance; and to W. Cooper, Esq. I am greatly indebted for the opportunity, through his means, of having in my possession for some weeks the identical specimens appertaining to various valuable cabinets in New York, from which Mr Barnes made his descriptions.

ARTICLE V.

Observations on the Naïades, and Descriptions of New Species of that and other Families. By Isaac Lea. Read before the American Philosophical Society, May 7, 1830.

SINCE I presented my last paper on the Naiades, which was published in the third volume of the Society's Transactions, I have been fortunate in obtaining many species hitherto undescribed.

I have possessed for several years many individual specimens which I supposed to be new, but which I deferred describing until I should possess of each kind individuals of different ages. My late acquisitions have converted my suppositions into certainty; and I now offer the following descriptions with a view to their publication in the fourth volume of the Society's Transactions, to be accompanied by figures executed like those attached to my last memoir.

In that memoir I took occasion to make some remarks on the "elevations on the surface of the disks." I had not at that time satisfied myself entirely in regard to the manner in which these were accomplished by the animal. Some fine specimens of the *Unio cornutus*, in all the stages of growth, having since been procured, I have been able to trace these formations through every degree.

It will be observed on examination, that the horns alternate; that is, those on one valve are not placed opposite to those on the other; consequently one is made at a time. The animal deposits the secreted carbonate of lime on the outside of the edge of one valve, where the horn is to be formed, and on the inside of the edge of the other; the consequence of which is, that when the horn is sufficiently elevated, the line of the opening at the base of the shell has diverged from the plane of the valves into an obtuse angle at this point. The deposit of the secretion is then reversed, and the line of the opening at the base is soon restored to the plane of the valves. If another horn is to be formed, this lateral increase of the edges is carried on until the same effect is produced on the other side of the shell. The natural consequence of this alternation is a depression on the outer side of one valve corresponding to the horn on the other, and thus we ever find it. In one of my specimens the turn is so short, after the formation of the last horn, that this side passes over the other and forms a plane one third of an inch, so that the specimen presents the curious phenomenon of a shell standing erect on its base, when placed on a smooth surface.

The plicæ or folds are formed on the same principle. In the basal and posterior margins of the plicated species we may see the line of opening undulated by every fold, and when the deviation from the plane takes place in one valve it is followed up always by the other. In the *Unio tuberculatus*, when tuberculated to the edge, these tubercles cause it to be crenate.

In the *Unio metanever* we are presented with different elevations on the disks. This beautiful and interesting species is furnished with elevations, small at the beaks, and enlarging towards the base along the umbonial slope. These elevations are antagonist, and being formed at the same time, we consequently see, in a certain stage of growth, quite a knob at the angle of the basal margin. In the *Unio lacrymosus*, which is furnished with smaller elevations on the umbonial slope, we find them to alternate.

When making some observations on "colour" in my last memoir, I mentioned that "the green irregular spots and marks" on the interior of the valves were "accidental, perhaps the effect of disease." Subsequent observation led me into an examination of these marks, and the result is a perfect conviction of their being epidermal matter, evidently placed occasionally between successive layers of nacre, as it were in anticipation of a future erosion of the beaks. In a specimen of *Unio pustulosus* (herein described) in my cabinet, erosion has taken place into the mass of its thick beaks to the distance of one third of an inch, where a *false beak* is exhibited covered with a thin layer of epidermal matter, and a fracture of this false beak displays another within, entirely covered with the same matter. In the same specimen, which is more eroded than any I have seen, a considerable portion of the cardinal tooth is visible from the exterior, and this portion is also covered with epidermal matter.

I will take the opportunity here to remark on the absolute necessity of studying the different ages of the species of this family, to enable us to decide upon new species. I have never been more thoroughly convinced of any thing than this. When I have been able to do so, I have always placed in my cabinet at least three or four specimens of different ages. Four years since, I obtained a large old specimen of the *Unio multiplicatus* (herein described), which I placed with my specimens of *Unio plicatus.* Two young specimens were received at the same time, and so totally different were they in appearance, that it did not occur to me there was any similarity between them and the old one. These were placed with the *Unio tuberculatus,* in the belief of their being a compressed variety of that species. A specimen subsequently received, which furnishes the engraving, proved at once their identity by displaying the numerous undulations in the region of the beaks.

I have continued to give my attention to the habits of the animals of this family, but I have in vain attempted to satisfy myself as to the nature of their food. Dissatisfied with the results of the observations mentioned in volume third, I procured, among other species, a fine *Unio cariosus,* the valves of which were much more gaping than usual. Selected specimens of various species were placed in a glass vase, in the bottom of which was placed clean white sand, so that their natural beds might be somewhat imitated. In this vessel they assumed their natural position by pushing the sand behind them with the protruded foot, thus forming a pit into which the base of the shell gradually fell, the ligament taking the most elevated situation. In this position they soon began to travel round the vessel, and this locomotion continued for some days, when it ceased entirely.

Their extreme timidity or apprehension on the approach of danger was very evident. At first the slightest agitation or movement of the vessel caused them to close their valves instantly. Being almost daily disturbed, this alarm after a time ceased, particularly with my fine *cariosus*, which now suffered even the agitation of the water without closing the valves, stretching out its fine dark and beautiful tentacula from the borders of its mantle, and forming by the contact of its edges two openings one below the other.

From the superior of these openings the constant stream ejected could be plainly perceived for two inches elevating the water at its surface. Being very anxious to ascertain through what part the water necessary to supply this stream was carried into the shell, I discovered it, after many experiments, to pass in by the inferior opening; that it passed out by the superior one had always been evident. This operation was unremitted while the water was fresh; when left unchanged for some days this current invariably ceased. Doubting the correctness of my former idea, as to the probability of their feeding on animalcula, from the circumstance of finding the passage of the water to exist only while fresh, and never when animalcula were visible even with a microscope of great power, I instituted some experiments by passing pieces of bread, very small pieces of worms, &c. between the tentacula. Several of them would sometimes remain for some minutes within the mantle and so far within as to be invisible, but they were in every case in a very short time thrown out with a rapid and sudden jet of water to the opposite side of the vessel.

These experiments were frequently repeated during the course of a year upon the same specimen, and the result was uniformly the same. No food introduced into the shell could be ascertained to have remained; it may therefore be pretty safely concluded, that neither animalcula nor food in a more solid state are necessary to the nourishment of the *Naïades.* What then are we to conclude it to be? Would the decomposition of water serve the purpose of nourishment as well as breathing? Certain it is, that during the many years I have been in the habit of almost constantly having them alive for examination, dissection, &c. I have never in any instance given them food, unless it was conveyed invisibly to them in the pure water with which our city is supplied through our works from the river, and which was given them every few days.

When I established the genus *Symphynota*[*], I remarked on the difficulties attending the present generic divisions of the family *Naïades*. Since that period a closer attention to these divisions has convinced me of the entire impossibility of defining limits to them. The hinges in the species of the different genera glide or shade away so completely into each other, that I have no hesitation in saying it is entirely impossible for any naturalist to mark out a line of unvarying character to most of them. It must therefore be conceded that other characters are required for generic divisions.

If we examine the

Anodonta cygnea (Lam.), we find the margin under the beak and ligament to be an uninterrupted line. In the

Iridina nilotica (Sowerby) this line is slightly interrupted under the point of the beak. In the

Anodon areolatus (Swainson) we have this interruption more distinctly marked, the elevations being larger and more curved, evidently forming an incipient tooth which approaches very closely to the

Alasmodonta marginata (Say), and forms with it a natural link. The next in the chain appears to be the

Alasmodonta rugosa (Barnes), which has an incipient lateral tooth; and that which follows very closely is the

Unio calceolus (Nob.), which has the lateral tooth very slightly more defined than the preceding. In the

Symphynota compressa (Nob.), we have the tooth more perfect and extended, forming a moderately well characterised lateral tooth of the genus *Unio*. The well known

Unio pictorum (Mya pictorum, Lin.) presents us with cardinal and lateral teeth completely formed. In this genus, the *Unio*, we have an infinite variety in the forms of teeth. In the

Symphynota alata (Nob.), the cardinal and lateral teeth are compressed in most specimens; and the next change we find, is in the

Hyria avicularis[†] (Lam.), in which the cardinal tooth is somewhat lamellar and forms nearly a line with the lateral tooth. The next "nuance" is in the

---

[*] See Vol. III. p. 442.

[†] When the animal of this genus shall be examined, it will be found, I have no doubt, to differ from the *Unio*, *Anodonta*, &c. For notwithstanding Lamarck's description, "elles ont intérieurement les impressions musculaires latérales des Nayades," I have discovered that the

Symphynota lævissima (Nob.), which possesses lamelliform cardinal and lateral teeth forming nearly a complete arc. Then follows the

Symphynota bialata (Nob.), the uninterrupted curved tooth of which is little more than an elevated line under the ligament and beaks. As far as one may be able to judge from a bad description and very bad drawing, the

Dipsas plicatus (Leach) may be with propriety placed at the end of this suite.

In the *U. oriens* described in this paper, we have a peculiarity in the formation of the termination of the lateral tooth, which is enlarged.

Under the impression, therefore, that the teeth in the Family *Naïades* do not form a sufficient distinctive character to compose genera, I propose to make a "division" of the family, the distinctive character of which will be *valves free* and *valves connate;* the genus *Unio* to include the first, the genus *Symphynota* to include the last. If subsequent groups be necessary, these may be composed of subgenera.

In my catalogue* of species, which I presumed should be considered as established, I gave the *undulatus* of Barnes as a synonym, considering it as a variety of the *plicatus.* Conversing with that naturalist over his cabinet some time before his death, he expressed himself as being very much of that opinion. At that period neither of us had seen a young specimen of this species; very recently I have been fortunate enough to obtain several, and the examination of the beaks of these, which are nearly perfect, convinces me, that although the *undulatus* resembles the *plicatus* in its general characters, yet, that the beaks are sufficiently dissimilar to make them specifically different.

---

extensor muscle of the foot is attached to the internal base of the cardinal tooth and there forms a remarkable cicatrix, which of course is over the large anterior (posterior of Lam.) cicatrix, while in all the numerous species of Naïades which I have examined, the cicatrix of the extensor muscle has been situated below the large anterior cicatrix. In anatomical structure they must therefore differ.

* Transactions, Vol. III.

UNIO TRAPEZOIDES. Plate III. fig. 1.

Testâ trapezio simili, inæquilaterali, trânsversâ, postice undulatâ; valvulis crassis; dentibus cardinalibus utriusque valvulæ duplicibus; lateralibus laminatis curvisque; margaritâ purpureâ et iridescente.

Shell trapezoidal, inequilateral, transverse, undulated behind; valves thick; cardinal teeth double in both valves; lateral teeth curved and lamelliform; nacre purple and iridescent.

Hab. Lake St Joseph, Louisiana. J. T. Griffith, Esq.
My Cabinet.
Cabinet of Prof. Vanuxem.

Diam. 1·9, Length 2·6, Breadth 4·3 inches.

Shell trapezoidal, more angular behind, transverse, undulated on posterior half; umbonial slope elevated almost into a carina, anterior to which the undulations are oblique and disposed to lie parallel to each other; posterior slope large and elevated into a carina; sides flattened; substance of the shell thick; beaks slightly prominent and incurved; ligament large, long and slightly curved; epidermis black and wrinkled; cardinal teeth double in both valves, crenate and deeply cleft in the left valve; lateral teeth, long, curved and lamelliform; anterior cicatrices distinct and rough; posterior cicatrices confluent; dorsal cicatrices situated under the posterior part of the cardinal tooth; ventral cicatrix very perceptible; cavity of the beaks wide and deep; nacre dark purple and iridescent.

Remarks.—This highly interesting species came into my possession through the kindness of J. T. Griffith, Esq. of Natchez. It approaches the *U. plicatus*[*] of Lesueur, more nearly than any other species with which I am acquainted; it differs, however, from that species, strikingly, in the colour of the nacre, in the general outline of the shell and in its remarkable square sides. The great peculiarity of this species is in its possession of a small cicatrix (which I propose to call the *ventral cicatrix*) anterior to the central part of the cavity of the shell. In no other species have I ever met with the slightest indication of this cicatrix, although I have examined numerous larger and more globose specimens of various species with this view.

---

[*] For the authority of this name and author, see Am. Conch. article *Unio crassus*; also Barnes's article in Silliman's Journal, Vol. VI. p. 120.

UNIO MULTIPLICATUS. Plate IV. fig. 2.

Testâ trapeziali, inæquivalvi, oblique transversâ, maxime undulatâ; valvulis crassissimis; dentibus cardinalibus crassis, lateralibus longis curvisque; margaritâ albâ et iridescente.

Shell trapezoidal, inequivalve, obliquely transverse, much undulated; valves very thick; cardinal teeth thick; lateral teeth long and curved; nacre pearly white and iridescent.

Hab. { Tennessee River. Prof. Vanuxem.
Ohio River. T. G. Lea.
My Cabinet.
Cabinet of Prof. Vanuxem.

Diam. 2·2, Length 3·8, Breadth 5·6 inches.

Shell trapezoidal, obliquely transverse, undulated except near the anterior margin, compressed towards basal and posterior margins; undulations diverge from the umbonial slope and in the superior part curve towards the dorsal margin which is carinate; substance of the shell very thick; beaks slightly prominent and rugose with undulations extending over the umbones which are flattened; ligament large, long and curved; epidermis black and much wrinkled; cardinal teeth thick and sulcate; lateral teeth large, long and slightly curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under side of the plate between the cardinal and lateral teeth; cavity of the beaks rather large and rounded; nacre pearly white, iridescent and surrounded by a distinct dark margin.

Remarks.—This fine large species was one of many fine shells brought by Prof. Vanuxem from the western states. It is very nearly allied to the *plicatus* (Lesueur) in its general characteristics, but when the beaks are not much eroded, it may be at once distinguished from that species by the numerous small irregular undulations which surround and cover the beaks, and of which the *plicatus* is entirely destitute except at the very tip of the beaks; where the small folds are entirely unconnected with the large ones. In a very young state no two species, scarcely, can be more different, the *multiplicatus* being entirely covered with undulations, while the *plicatus* possesses none, except the small ones at the tip. In this state it resembles exceedingly the *tuberculatus* of Barnes, and when I received my first specimen, I referred it to that species, considering it a variety, and should most probably have continued to be of that opinion, had I not obtained a large specimen sufficiently perfect to display the irregular undulations in the region of the beaks. The facts mentioned above, show the absolute necessity of studying the young in making ourselves acquainted with the species.

UNIO ASPERRIMUS. Plate V. fig. 3.

Testâ sebquadrangulari, inæquilaterali, postice biangulari, natibus ad baseos marginem sulcatâ et nodulis instructâ; valvulis percrassis; natibus elevatis; dentibus cardinalibus prægrandibus, lateralibus magnis subrectisque; margaritâ pulchrâ et iridescente.

Shell sub-quadrangular, inequilateral, biangular behind, sulcated from beaks to basal margin, thick and noduled; valves very thick; beaks elevated; cardinal teeth very large; lateral teeth large and nearly straight; nacre beautifully pearly and iridescent.

Hab. Ohio River. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Lyceum of Natural History of New York.

Diam. 2·3, Length 3·6, Breadth 4·8 inches.

Shell sub-quadrangular, biangular behind, sulcated from beak to basal margin, roughly noduled and thick; basal margin emarginate; substance of the shell thick; beaks prominent, retuse; noduled along the umbonial slope and before the furrow, which is smooth; posterior slope covered with nodules; nodules posterior to the furrow are disposed to be transverse and on the umbones erect or recurved; ligament large; epidermis wrinkled and fuscous in adult specimens,—in younger specimens it is yellowish brown with obsolete rays; cardinal tooth very large, widely cleft, sulcated and crested in the left valve, in the right valve emerging from a pit; posterior cicatrices confluent; anterior cicatrices distinct, the great one deep; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks angulated, large and deep; nacre beautifully pearly white and iridescent.

Remarks.—This fine and interesting species is nearly allied to the *U. lacrymosus* (Nob.). It differs from it distinctly in the possession of nodules which are rough and disposed to be erect and transverse. The tubercles of the *lacrymosus* take a direction towards the basal margin, and are similar to tears flowing down the cheek. The posterior margin in the present species is more protruded, while the area of the anterior portion is smaller than that of the lacrymosus. It cannot be mistaken for the *U. metanever* (Rafinesque), which possesses large elevations along the umbonial slope. In younger specimens than the one represented here the basal and posterior margins are more rounded.

UNIO CONGARÆUS. Plate VI. fig. 4.

Testâ rhomboideo-ellipticâ, transversâ, inæquilaterali; valvulis tenuibus; natibus subundulatis; dente cardinali obliquo compressoque; dentibus lateralibus longis, et prope terminos posteriores auctis; margaritâ sericeâ et iridescente.

Shell elliptico-rhomboidal, transverse, inequilateral; valves thin; beaks slightly undulated; cardinal tooth oblique, compressed; lateral teeth long and enlarged towards the posterior end; nacre satinlike and iridescent.

Hab. Congaree River, South Carolina.

My Cabinet.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of H. C. Carey.
Cabinet of the Academy of Natural Sciences, Philadelphia.

Diam. ·7, Length ·1, Breadth 1·6 inches.

Shell elliptico-rhomboidal, transverse, somewhat flattened at the sides; posterior slope furnished with slight undulations; substance of the shell thin; beaks slightly prominent, and furnished with parallel concentric undulations near the tips; ligament short; epidermis yellow, and yellowish brown; rays green and numerous; cardinal tooth oblique, compressed, and slightly cleft in the left valve—in the right single; lateral teeth long, slightly curved and enlarged towards the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated under the plate, between the cardinal and lateral teeth; nacre satin like, and beautifully iridescent.

Remarks.—I obtained several specimens of this shell, on the shores of the Congaree, at Columbia, S. C. It resembles the *radiatus* (Gmelin) and *complanatus** (Solan.), which species are frequently mistaken for each other, and this may readily be confounded with either of them. It has, like the *radiatus*, many rays, but differs in being more angulated on the umbonial slope, and in measuring less from the posterior dorsal margin to the basal margin. It differs from the *complanatus* in its rays, and in having slight undulations on the posterior slope. It is more diminutive in size than either, not being more in volume than one-fifth of the *complanatus* from the same locality.

UNIO ORIENS. Plate VI. fig. 5.

Testâ longo-ovatâ, transversâ, inæquilaterali, compressâ et radiis pulcherrimis pictâ, valvulis tenuibus; natibus subprominulis et retusis; dentibus cardinalibus

---

* For reclamation of this species, see Vol. III. p. 416.

parvis et imperfectis, lateralibus imperfectis et indivisis; margaritá cæruleo-albá, iridescente, et in natium cavo purpureá.

Shell long-ovate, transverse, inequilateral, compressed and beautifully rayed; valves thin; beaks scarcely prominent and retuse; cardinal teeth small and imperfect; lateral teeth imperfect and divided; nacre bluish white, iridescent and purple in the cavity of the beaks.

Hab. Ohio river, T. G. Lea.
My Cabinet.
Cabinet of R. Peter, Pittsburgh.
Cabinet of Dr Hildreth, Marietta, Ohio.

Diam. ·5, Length 1·1, Breadth 2·8 inches.

Shell long-ovate, transverse, compressed; substance of the shell very thin; beaks scarcely prominent, and situated towards the anterior margin; ligament linear; epidermis slightly wrinkled, yellowish, with oblique interrupted green rays, which enlarge posteriorly; cardinal teeth very imperfect; lateral teeth straight, very imperfect, (having little or no longitudinal division, even in the left valve) enlarged at posterior termination; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks wide and very shallow; nacre bluish white, iridescent, purple in the cavity of the beaks.

Remarks.—The specimen which is here described and figured, was sent to me three or four years since, and has never ceased to excite in me great interest and attention. The very imperfect state of the teeth compelled me to doubt of the propriety of erecting it into a new species, although the specimen bore no appearance of a malformation in any other part, however different it was from other species of the family I had seen. Two other specimens, one of which is young, having recently come into my possession, prove to possess precisely the same characters in every respect, and the only difficulty which now stood in the way of giving it a place in our systems was to determine its *genus!* It appears to me, for the present, most proper to place it with the *Uniones.* It cannot be placed with the *Anodonta* of Lam. for he describes that genus as having "cardo linearis edentulus." It would be equally difficult to class it with the *Alasmodonta* of Say, for that conchologist says, "hinge with a primary tooth in each valve." In the *oriens* the cardinal and lateral teeth are equally imperfect, and in this respect it resembles the *U. soleniformis* (Nob.), though much less defined. Under these circumstances, it appeared necessary to give it a place with the Uniones.

UNIO BREVIDENS. Plate VI. fig. 6.

Testâ subtriangulari, inæquilaterali, transversâ; valvulis crassis; dentibus cardinalibus modicis, lateralibus curvis, brevibus, crassisque; margaritâ albâ.

Shell subtriangular, inequilateral, transverse; valves thick; cardinal teeth rather small; lateral teeth curved, short, and thick; nacre pearly white.

Hab. Ohio, William Cooper.
My Cabinet.
Cabinet of Lyceum of Natural History of New York.
Diam. ·8, Length 1·2, Breadth 1·7 inches.

Shell sub-triangular, angular behind, transverse; umbonial slope curved; sides flattened; substance of the shell thick; beaks slightly prominent; ligament short; epidermis yellow, wrinkled; rays small, slightly curved and interrupted; cardinal tooth rather small, slightly elevated and widely cleft in the left valve, single and emerging from a pit in the right valve; lateral teeth curved, short and thick, posterior and anterior cicatrices both distinct; the smaller posterior one being placed directly over the larger and beneath the point of the lateral tooth; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks arched, shallow; nacre pearly white.

Remarks.—For this interesting and fine species we are indebted to the liberality of the members of the Lyceum of Natural History of New York, who, in accordance with their known zeal in the promotion of natural science, promptly passed a vote to permit their new fluviatile shells (herein described) to be described for, and inserted in our Transactions, under the impression that science would be benefited by their being embodied in one paper with those which I was about to publish. This species somewhat resembles *U. triangularis* of Barnes. It differs from it in being less ventricose, more ponderous, possessing thicker teeth and in the rays which are interrupted indistinct lines.

Unio Pustulosus. Plate VII. fig. 7.

Testâ modice productâ, æquilaterali, inflatâ, dimidio postico tuberculatâ; valvulis crassis; natibus prominentibus et ad apices granulatis; dentibus cardinalibus subgrandibus; lateralibus brevibus, crassis, rectisque; margaritâ albâ et iridescente.

Shell rather elongated, equilateral, inflated, tuberculated on posterior half; valves thick; beaks elevated and granulated at tip; cardinal teeth rather large; lateral teeth short, thick and straight; nacre pearly white and iridescent.

Hab. { Ohio, T. G. Lea.
Alabama river, Judge Tait.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of H. C. Carey.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Peale's Museum.
Unio verrucosus. Var. *b*? Barnes.

Diam. 1·4, Length 2·2, Breadth 2·1 inches.

Shell rather elongated, equilateral, inflated, irregularly tuberculated on posterior half, but not on the first and second growths; tubercles generally large; substance of the shell thick; beaks elevated and granulated at tip; ligament short and thick; epidermis bright brown; a single broad interrupted ray passes from the beak nearly to the centre of the disk; cardinal tooth rather large and widely cleft in the left valve—single and emerging from a pit in the right valve; lateral teeth short, thick and straight; anterior and posterior cicatrices both distinct; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks deep and angulated; nacre pearly white and iridescent.

Remarks.—This species has heretofore been considered as the *Verrucosus* of Barnes. Although the general form resembles the *Verrucosus*, it differs from it in several essential characters. It has not the beautiful recurved, and finely undulated beaks, nor has it the dark chocolate coloured nacre of the true *Verrucosus*. It has a large interrupted ray across the centre of the disk, which is absent in the other, and the tubercles are more in the form of blisters. In the *Verrucosus*, the first and second growths are furnished with tubercles; in the *Pustulosus*, they are not. Objections may be made to the use of colour of nacre as a character. It may be safely used, when on examination of many specimens, there is no appearance of fading away by tints into another colour. The *U. torsus* (Rafinesque) presents us always with a rich chocolate nacre. The *U. rectus* (Lam.) varies from rich purple and salmon through all the tints of these colours to perfect white, and the same may be said of the *U. cuneatus* (Barnes) and *U. complanatus* (*Mya complanata*, Solan.). The *U. circulus* (Nob.) varies from perfect white to dark pink. These variations of colours are frequent in this genus. Of the numerous specimens of *Verrucosus*, I have never seen one which was not chocolate coloured. In the *Pustulosus*, I have never seen the nacre other than white.

UNIO STAPES. Plate VII. fig. 8.

Testâ triangulari, subæquilaterali, postice valde angulatâ, tuberculatâ; valvulis crassis; dentibus cardinalibus subgrandibus; lateralibus brevibus, a cardinalibus separatis; et versus baseos marginem vergentibus; margaritâ albâ.

Shell triangular, nearly equilateral, very angular behind, tuberculated; valves thick; cardinal teeth rather large; lateral teeth short, distinct from the cardinal teeth and pointing to the basal margin; nacre pearly white.

Hab. Alabama river, Judge Tait.

My Cabinet.

Diam. ·9, Length 1·5, Breadth 1·6 inches.

Shell triangular, nearly equilateral, very angular behind, and rounded before; anterior portion furnished with triangular formed tubercles, the apices of which point to basal margin; portion immediately before umbonial slope free from tubercles; umbonial slope elevated and tuberculated from the beaks to the margin; posterior slope truncate, undulated, nearly perpendicular, flat, with the exception of a small portion of the margin behind the ligament; umbones flattened; substance of the shell thick; beaks prominent; ligament short and thick; epidermis yellow, slightly wrinkled, and furnished with indistinct, small, green pencil marks in the place of rays; cardinal tooth rather large, elevated and widely cleft in the left valve, single and emerging from a pit in the right valve; lateral teeth very short, straight and pointing to the basal margin; the cardinal and lateral teeth are separated by a flat plate; posterior and anterior cicatrices both distinct, the smaller posterior one being placed directly over the larger, and beneath the point of the lateral tooth; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks deep and angulated; nacre very pearly and iridescent.

Remarks.—This very curious and interesting shell was among the many fine specimens sent me by Judge Tait, to whose kindness I am under great obligations for several of the new species here described. The present species, in outline, is an anomaly in the family Naiades. The truncature behind is almost as abrupt as that of any *Donax*. This truncature gives the shell the form of a stirrup, and causes the lateral teeth to take a direction (towards the basal margin) peculiar to this species. The triangular form of the tubercles, particularly on the superior anterior part, is so peculiar as to render it impossible to confound it with any other species.

UNIO PUSTULATUS. Plate VII. fig. 9.

Testâ suborbiculari, æquilaterali, inflatâ, margine posteriori emarginatâ; valvulis crassis, et duabus tuberculorum seriebus instructis; dentibus cardinalibus magnis; lateralibus brevibus subrectisque; margaritâ albâ et iridescente.

Shell nearly circular, equilateral, inflated, posteriorly emarginate; valves thick and furnished with two rows of tubercles; cardinal teeth large; lateral teeth short and nearly straight; nacre pearly white and iridescent.

Hab. { Ohio, T. G. Lea.
Tennessee, Professor Vanuxem.

My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. 1·3, Length 1·9, Breadth 2·1 inches.

Shell nearly circular, equilateral, inflated, posteriorly emarginate, furnished with two vertical rows of tubercles on each valve, one in a direct line from the beaks to the basal margin, the other along the umbonial slope; those of the latter resemble pustules. The first tubercle appears on the third growth; the fourth and each successive growth have two parallel to each other. Posterior margin granulate; substance of the shell thick; beaks elevated, slightly recurved, and granulate at the tip; ligament short and thick; epidermis yellowish brown and rather smooth; cardinal tooth large, elevated and widely cleft in the left valve, single and emerging from a pit in the right valve; lateral teeth short and nearly straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks deep and angulated; nacre pearly white and iridescent.

Remarks.—This species somewhat resembles the *U. verrucosus* (Barnes), Var. *b*, erected into a new species in this paper under the name of *pustulosus*. It differs in being more transverse and in being destitute of the broad single ray which passes from the beak of the latter. In the arrangement of the tubercles it is altogether different;

the *pustulatus* having a row, which resembles the *cornutus* in regularity. These elevations however in the *cornutus* alternate in the two valves, while in this species they are antagonist. In very perfect young specimens, a minute tubercle may sometimes be observed on the first growth. The elevations along the umbonial slope have more resemblance to pustules, than those of the anterior row.

UNIO LENS. Plate VIII. fig. 10.

Testâ lenticulari, subventricosâ, æquilaterali; valvulis subcrassis; dentibus cardinalibus magnis; lateralibus brevibus subrectisque; margaritâ albâ, raro roseâ.

Shell lenticular, subventricose, equilateral; valves somewhat thick; cardinal teeth large; lateral teeth short and nearly straight; nacre white, rarely rose coloured.

Hab. { Ohio, T. G. Lea.
Tennessee, Professor Vanuxem.
My Cabinet.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of H. C. Carey.

Diam. ·6, Length ·9, Breadth 1·2 inches.

Shell lenticular, somewhat ventricose, equilateral; substance of the shell rather thick; beaks slightly prominent, undulated at tip; ligament short and thick; epidermis smooth, anterior to the umbonial slope brown, posterior yellowish; cardinal teeth large and oblique, deeply cleft in the left valve; lateral teeth short and nearly straight, in the left valve the superior division is much the smallest; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks angular and somewhat deep; nacre white, pearly and iridescent, sometimes rose coloured.

Remarks.—This species very closely resembles the *U. circulus*

(Nob.). It differs from it, however, in being less ventricose, in having the beaks less elevated, in being usually more transverse, and in having a paler brown colour. In the *circulus*, the line of division of the brown and yellow is more distinct. In the *lens*, the brown is sometimes replaced, over the whole surface, by yellow.

UNIO ANODONTOIDES. Plate VIII. fig. 11.

Testâ angusto ellipticâ, transversâ, inæquilaterali, inflatâ; valvulis subcrassis; natibus prominulis; dentibus cardinalibus in valvulis ambabus duplicibus et valde erectis; dentibus lateralibus longis, a cardinalibus separatis, subcurvatis; margaritâ albâ et colore salmonis parum tinctâ.

Shell narrow-elliptical, transverse, inequilateral, inflated; valves somewhat thick; beaks slightly prominent; cardinal teeth double in both valves and very erect; lateral teeth long, slightly curved and separate from the cardinal teeth; nacre pale salmon and white.

Hab. { Mississippi river, T. W. Robeson.
Alabama river, Judge Tait.
Ohio river, T. H. Taylor.

My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Professor Vanuxem.
Cabinet of Dr Hildreth, Marietta, Ohio.

Diam. 1·5, Length 1·9, Breadth 4·1 inches.

Shell narrow-elliptical, much inflated, sometimes almost cylindrical; substance of the shell somewhat thick; beaks slightly prominent, placed near the anterior margin; ligament long, narrow, and nearly straight; epidermis yellowish, very smooth, shining, posterior to the umbonial slope fuscous, rarely rayed; cardinal tooth double in both valves, compressed, elevated; lateral teeth lamellar, very long, slightly curved and separated from the cardinal teeth by the absence of a plate; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated across the cavity of the beaks; cavity of the beaks rounded, and not deep; nacre salmon or white and iridescent.

Remarks.—This singularly formed Unio resembles in its exterior an *Anodonta*, having a remarkably smooth epidermis and possessing in some degree the exterior of the *A. cataracta* (Say). It is easily distinguished from any described species. In some specimens the arcuation of the basal margin is so great that it might almost be taken for a malformation.

UNIO GLANS. Plate VIII. fig. 12.

Testâ ovato-ellipticâ, transversâ, inæquilaterali, inflatâ; valvulis crassis; dentibus cardinalibus subgrandibus et elevatis, lateralibus, laminatis rectisque; margaritâ purpureâ.

Shell ovate-elliptical, transverse, inequilateral, inflated; valves thick; cardinal teeth rather large, elevated; lateral teeth straight and lamelliform; nacre purple.

Hab. Ohio river, T. G. Lea.
My Cabinet.
Cabinet of S. W. Conrad.

Diam. ·7, Length ·8, Breadth 1·3 inches.

Shell ovate-elliptical, transverse, inflated; substance of the shell rather thick; beaks somewhat prominent; ligament small; epidermis black, or dark brown, and sometimes rayed; cardinal teeth rather large and elevated, in the left valve double and obliquely and deeply cleft, in the right single, three sided, and pointed; lateral teeth straight and lamelliform; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks wide and subangulated; nacre purple, except along the anterior and basal margins.

Remarks.—Although this small shell has no strikingly peculiar character, it is nevertheless of a different species from any I have seen. In form, it has more resemblance to *U. zigzag* (Nob.), than to any other species, but differs altogether in the epidermis and nacre, being generally destitute of rays, and having a purple nacre.

UNIO ELEGANS. Plate IX. fig. 13.

Testâ subtriangulari, subæquilaterali, per umbones complanatâ; latere antico valvularum crassiori; epidermide luteo-viridi; radiis numerosis ex lineis angulatis compositis; natibus complanatis incurvisque; dentibus cardinalibus elatis grandibusque, lateralibus subrectis; margaritâ albâ et iridescente, raro roseâ.

Shell subtriangular, nearly equilateral, flattened over the umbones; valves thick before, thinner behind; epidermis yellowish green with numerous rays formed of zigzag lines; beaks incurved and flattened; cardinal teeth large and elevated; lateral teeth nearly straight; nacre pearly white and iridescent, rarely rose coloured.

Hab. Ohio river, T. G. Lea.
My Cabinet.
Cabinet of Prof. Vanuxem.
Cabinet of H. C. Carey.
Cabinet of P. H. Nicklin.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of the American Philosophical Society.

Diam. 1, Length 1·5, Breadth 1·9 inches.

Shell subtriangular, nearly equilateral, acutely angular behind; flattened over the umbones; umbonial slope carinate; posterior slope much flattened; substance of the shell thick before, thinner behind; beaks flattened, incurved, nearly touching; ligament short and thick; epidermis yellowish green, with numerous rays, formed of zigzag lines, diverging from the beaks to all parts of the margin; basal margin slightly emarginate; cardinal tooth large, elevated, and widely cleft in the left valve, and emerging from a pit in the right valve; lateral teeth nearly straight; anterior and posterior cicatrices both distinct; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks rounded; nacre pearly white, (rarely pink) and iridescent.

Remarks.—This interesting and beautiful species has been considered as a variety of the *U. donaciformis* (Nob.). I had but a single and imperfect specimen of this shell when I described the *donaciformis*, and I presumed it to be merely a variety of that shell. Subsequently, my attention being drawn particularly to it, I procured some of all the different growths, and among them the beautiful specimen now figured, which is the only one I have seen of a pink colour. On an examination of these, I could no longer doubt of its being distinct; but some doubts have arisen in my mind whether the *donaciformis* may not be a variety of the *U. zigzag* (Nob.). The specimen described as *donaciformis* is a very fine and perfect one, and if it be a true species is the only one I have seen. Among the numerous specimens of *zigzag* which I have examined, none have had those perfect and beautifully pointed beaks of the *donaciformis;* should future specimens fully establish the *donaciformis*, its natural place will be between the *zigzag* and the present described species. These observations it is hoped will draw the attention of conchologists to this species, with the expectation of being able, by examining many specimens, to decide upon the question.

UNIO EBENUS. Plate IX. fig. 14.

Testâ subellipticâ, oblique recurvâ, inæquilaterali, ventricosâ; valvulis crassis; natibus prominentibus et subterminalibus; epidermide nigro-fuscâ, sed post nates luteâ; dentibus cardinalibus magnis, lateralibus magnis curvisque; margaritâ albâ.

Shell subelliptical, obliquely recurved, inequilateral, ventricose; valves thick; beaks elevated and nearly terminal; epidermis blackish brown, behind the beaks yellow; cardinal teeth large; lateral teeth large and curved; nacre pearly white.

Hab. Ohio river, T. G. Lea.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.

Diam. 1·1, Length 1·5, Breadth 1·6 inches.

Shell subelliptical, obliquely recurved, inequilateral, very ventricose;

substance of the shell very thick; beaks nearly terminal and very much elevated; ligament rather short and thick; epidermis blackish brown, behind the beaks on the *second growth* it is yellow; tip of the beaks yellowish; cardinal teeth large and oblique, being in a line nearly parallel to the lateral tooth which is thick and slightly curved; posterior and anterior cicatrices both distinct; dorsal cicatrices situated on the under side of the plate between the cardinal and lateral teeth; cavity of the beaks deep and angulated; nacre pearly white and iridescent.

Remarks.—This species, which seems to be peculiar in the yellow mark behind the beaks, resembles the *U. mytiloides* (Rafin.) and might easily be mistaken for a ventricose variety of that species where the beaks are so much eroded as to have destroyed the second growth. A young individual of second growth is represented in the plate to exhibit the curious distribution of colour. The posterior third is yellow and the remainder green, the line of separation being very distinct. Those of three growths usually have no trace of yellow on the third growth which takes a brown colour. The first growth, which may be considered the tip of the beaks, is usually yellow or yellowish green over its whole surface. The largest specimen given in the plate is not more than one fourth the size it is sometimes found. It is selected, because it is the largest I have seen with the beaks sufficiently perfect to exhibit the peculiar yellow colour of this part.

UNIO ASPER. Plate IX. fig. 15.

Testâ subtriangulari, inæquilaterali, postice angulatâ, valde tuberculatâ; valvulis crassis; dentibus cardinalibus subgrandibus; lateralibus aliquantulum curvatis; margaritâ albâ.

Shell subtriangular, inequilateral, angular behind, much tuberculated; valves thick; cardinal teeth rather large; lateral teeth slightly curved; nacre pearly white.

Hab. Alabama river, Judge Tait.

My Cabinet.

Diam. ·9, Length 1·4, Breadth 1·8 inches.

Shell subtriangular, angular behind and rounded before, covered with small rough tubercles except in a furrow which passes from the beak obliquely to the basal margin which is there arcuate; the tubercles along the posterior slope arrange themselves into a series of undulations as far as the beaks; substance of the shell thick; beaks slightly prominent: ligament short and thick; epidermis brown and wrinkled; cardinal tooth rather large, slightly elevated and widely cleft in the left valve, single and emerging from a pit in the right valve; lateral teeth small, slightly curved in a direction over the cardinal teeth; posterior and anterior cicatrices both distinct; dorsal cicatrices situated on the under part of the cardinal tooth within the cavity; cavity of the beaks deep and angulated; nacre very pearly and iridescent.

Remarks.—The *asper* is more covered with tubercles than any species I have seen, these being small and numerous. It bears some resemblance to *U. tuberculatus* (Barnes), and *U. lacrymosus* (Nobis.). It differs from the *tuberculatus* in outline, and in possessing a furrow passing from the beaks to the basal margin. It differs from the *lacrymosus* in the form of the tubercles (which in that species so much resemble flowing tears) and in the roughness and colour of the exterior.

Unio Fabalis. Plate X. fig. 16.

Testâ subellipticâ, transversâ, inæquilaterali, crassâ; valvulis crassis; radiis capillaribus undantibusque; dentibus cardinalibus parvis; lateralibus brevibus, crassis, et in termino postico auctis; margaritâ albâ et iridescente.

Shell subelliptical, transverse, inequilateral, thick; valves thick; rays hair-like and undulating; cardinal teeth small; lateral teeth short, thick and enlarged towards the posterior end; nacre pearly white and iridescent.

Hab. Ohio river, T. G. Lea.

My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of R. E. Griffith, M.D.
Cabinet of Academy of Natural Sciences.

Diam. ·3, Length ·5, Breadth 1 inch.

Shell subelliptical, transverse, thick; substance of the shell thick; beaks slightly prominent; ligament short; epidermis dark, and finely wrinkled; rays green, hair-like, and undulating, particularly on the posterior half; cardinal tooth double, and deeply cleft in the left valve and single in the right; lateral teeth short, straight, thick and enlarged towards the posterior end; posterior and anterior cicatrices both distinct, the smaller posterior one being placed directly over the larger and beneath the point of the lateral tooth; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks shallow and arched; cavity of the shell small and irregularly undulated; nacre pearly white and iridescent.

Remarks.—This little species first attracted my attention about three years since, when I had seen but a single specimen. Although a very small shell, I felt satisfied it possessed the characters of an adult, and my curiosity being much excited in regard to it, I made many efforts to obtain other individuals. For several of these I am indebted to the kindness of Dr Hildreth of Marietta and to Mr Robert Peter and J. S. Craft, Esq. of Pittsburg. The *fabalis* most resembles the *parvus* of Barnes. It has nearly the same size and outline; but differs much in the thickness of the valves and in the beaks. The *fabalis* is covered with rays, the *parvus* has none.

UNIO SOLENIFORMIS. Plate X. fig. 17.

Testâ angusto-ellipticâ, transversâ, compressâ, inæquilaterali, ad finem utrumque rotundatâ; valvulis tenuibus; natibus prominulis; valvulâ utrâque tuberculum *parvum et simplicem in loco dentis cardinalis habente; dentibus lateralibus, longis, rectis, et valde imperfectis; margaritâ cæruleo-albâ et iridescente.*

Shell narrow-elliptical, transverse, compressed, inequilateral, rounded at both ends; valves thin; beaks slightly prominent; cardinal tooth a simple, small tubercle in both valves; lateral teeth long, straight and very imperfect; nacre bluish white and iridescent.

Hab. Ohio, T. G. Lea.

My Cabinet.

Cabinet of Dr Hildreth, Marietta, Ohio.

Diam. 1·1, Length 1·7, Breadth 4·3 inches.

Shell narrow-elliptical, transverse, rounded at both ends, compressed from the beaks to the basal margin over the umbones, slightly arcuated on the basal margin; posterior margin much compressed, substance of the shell thin; beaks minutely undulated, slightly prominent and approaching the anterior margin; ligament long and thick; umbones and inferior parts flattened; umbonial slope rounded and elevated; epidermis very dark brown and wrinkled; cardinal tooth formed of a simple small tubercle in both valves, larger in the right valve: lateral teeth straight, and so imperfect as to be divided, even in the left valve, only near the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated under the plate between the cardinal and lateral teeth; cavity of the beaks wide and shallow.

Nacre bluish white and iridescent.

Remarks.—A single specimen of this extraordinary and highly interesting shell came into my possession in 1827. The outline and teeth presented such an anomaly, that I was induced when I published my other memoirs on this family to lay it aside until I could better satisfy myself in regard to it. It was a very old individual, and I feared the peculiar characters it presented might have been produced by malformation and extreme age. After two or three years of unwearied attempts, I fortunately procured from Mr T. H. Taylor of Louisville a junior and an adult specimen, both exceedingly perfect, the latter of which is here represented. This proteus family seems destined to perplex the zoologist and to lead him into an inexplicable labyrinth. The present species forms a natural link between *Unio* and *Anodonta*, by means of this imperfect lateral tooth.

UNIO ACUTISSIMUS. Plate X. fig. 18.

Testâ angusto-ellipticâ, inæquilaterali, postice acute angulatâ; undulis a clivo umboniali divaricantibus; natibus prominulis; valvulis tenuissimis; dentibus cardinalibus parvis, lateralibus longis rectisque; margaritâ tenuissimâ, colore salmonis tinctâ.

Shell narrow-elliptical, inequilateral, transverse, acutely angulated behind, with undulations diverging from the umbonial slope; beaks slightly prominent; valves very thin; cardinal teeth small; lateral teeth long and straight; nacre salmon-coloured and very thin.

Hab. Alabama river, Judge Tait.

My Cabinet.

Diam. ·4, Length ·5, Breadth 1·1 inches.

Shell narrow-elliptical, transverse, acutely angulated behind, with undulations diverging from the umbonial slope; substance of the shell very thin; beaks slightly prominent and placed about one third the distance from anterior margin; ligament linear; epidermis yellow, smooth and shining; cardinal teeth small and single in both valves; lateral teeth long and straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices within the cavity of the beaks; cavity of the beaks wide and shallow, nacre salmon-coloured and very thin.

Remarks.—This minute shell, among the smallest of the species, is most nearly allied in outline to *U. anodontoides.* It differs from it in having undulations, and is totally dissimilar in point of magnitude.

UNIO VARICOSUS. Plate XI. fig. 20.

Testâ subellipticâ, obliquâ, postice compressâ, varicibus transversis et concentricis instructâ; valvulis præcrassis; natibus subterminalibus, prominentibus, incurvis; dentibus cardinalibus modicis; lateralibus longis, magnis et subrectis; margaritâ albâ.

Shell subelliptical, oblique, compressed behind, varicose, with transverse concentric elevations; valves very thick; beaks nearly terminal, elevated, incurved; cardinal teeth rather small; lateral teeth long, large and nearly straight; nacre pearly white.

Hab. Ohio river, T. G. Lea.
My Cabinet.
Cabinet of Prof. Vanuxem.
Cabinet of P. H. Nicklin.

Diam. 2·1, Length 3, Breadth 4·2 inches.

Shell subelliptical, oblique, compressed and rounded behind, varicose from near the beak to basal margin, with transverse concentric elevations along the lines of successive growth; substance of the shell very thick; beaks nearly terminal, elevated, incurved; ligament long and large; epidermis reddish brown; cardinal tooth rather small, direction same as lateral tooth, widely cleft in the left valve, in the right valve emerging from a pit; lateral teeth long, large and nearly straight; anterior and posterior cicatrices both distinct; dorsal cicatrices situated on the lower part of the cardinal tooth, and on the under side of the plate between the cardinal and lateral teeth; cavity of the beaks rather deep and rounded; nacre pearly white.

Remarks.—This species most resembles the *U. Æsopus* (Green). It differs from it, however, in being rounded behind, in the beaks being nearly terminal, in the varices being less elevated and more transverse; and in the absence of elevations along the umbonial slope. There being no varicose undulations on young individuals, which are generally obscurely radiated, it is difficult for the unpractised eye to recognize the species to which they belong.

UNIO CASTANEUS. Plate XI. fig. 21.

Testâ subellipticâ, inæquilaterali, obliquâ, inflatâ; valvulis crassis; dentibus cardinalibus magnis; lateralibus subrectis brevibusque; margaritâ maxime fulgente et iridescente.

Shell subelliptical, inequilateral, oblique, inflated; valves thick; cardinal teeth large; lateral teeth nearly straight and short; nacre very pearly and iridescent.

Hab. Alabama river, Judge Tait.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.

Diam. ·6, Length ·8, Breadth 1 inch.

Shell subelliptical, oblique; substance of the shell thick; beaks prominent and situated towards the anterior margin; ligament short; epidermis slightly wrinkled, dark brown anterior to the umbonial slope, and yellowish posterior, where there are a few obsolete rays; cardinal tooth large, slightly elevated, deeply cleft in the left valve and emerging from a pit in the right valve; lateral teeth short and nearly straight; posterior and anterior cicatrices both distinct; dorsal cicatrices situated on the under part of the cardinal tooth within the cavity; cavity of the beaks wide and shallow; nacre very pearly and iridescent.

Remarks.—This small species is allied to the *U. circulus* (Nob.) in colour and to *U. ellipsis* (Nob.) in form. It has the posterior slope yellow, which is so in the *circulus.* The specimen described and figured here is not more than one fourth of the size of an imperfect specimen which accompanied it.

UNIO MULTISTRIATUS. Plate XII. fig. 22.

Testâ striatâ, transversâ, inæquilaterali; natibus prominulis; umbonibus rugosis; dente cardinali obliquo, laminato, in valvulâ sinistrâ unico, in dextrâ duplici; dente laterali longo et subrecto; margaritâ cæruleo-albâ.

Shell striate, transverse, inequilateral; valves thin; beaks slightly prominent; umbones rugose; cardinal tooth oblique, lamelliform, single in the left valve and double in the right; lateral tooth long and nearly straight; nacre bluish white.

Hab. Brazil, Mrs Mawe.

My Cabinet.

Diam. ·7,	Length 1,	Breadth 1·9 inches.

Shell subrectangular, transverse, slightly compressed and rounded nearly alike at both ends; substance of the shell rather thin; beaks slightly prominent, surrounded by wrinkles forming acute angles with each other, extending over the umbones and some distance down the umbonial slope; ligament linear; epidermis dark brown and wrinkled; cardinal tooth oblique, lamelliform, *single* in the left valve and *double* in the right; lateral teeth long, lamelliform and nearly straight; anterior and posterior cicatrices both confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks wide and shallow; nacre bluish white and slightly iridescent in posterior margin.

Remarks.—The specimen from which the above description was made was sent to me by Mrs Mawe of London. This species approaches in outline to some of the varieties of the *U. complanatus* (Solan.). In the flexuous rugosities of the beaks it resembles the *U. corrugatus* (Lam.) and *U. cæruleus* (Nob.). It differs however from them both in outline.

UNIO DECISUS. Plate XII. fig. 23.

Testâ inæquilaterali, obliquâ, cuneatâ, scalenâ, crassâque; valvulis percrassis; natibus elevatis, incurvatis, fere terminalibus; dentibus cardinalibus aliquantulum parvis, lateralibus crassis; margaritâ albâ.

Shell inequilateral, oblique, wedge shaped, scaleniform and thick; valves very thick; beaks elevated, incurved, nearly terminal; cardinal teeth rather small; lateral teeth thick; nacre pearly white.

Hab. Alabama river, Judge Tait.

My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of H. C. Carey.
Cabinet of P. H. Nicklin.
Cabinet of the American Philosophical Society.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of the Lyceum of Natural History of New York.

Diam. 1·4, Length 1·7, Breadth 3·2 inches.

Shell wedge-shaped, thick anteriorly and scaleniform; substance of the shell thick anteriorly and thin posteriorly; beaks nearly terminal, prominent and incurved, generally decorticated; ligament rather small; epidermis yellowish brown, sometimes possessing oblique, indistinct, brown rays; cardinal tooth short and slightly elevated, in the left valve double and deeply cleft, in the right valve emerging from a pit; lateral teeth thick and curving over the cardinal teeth; posterior and anterior cicatrices both distinct; the smaller posterior cicatrix situated against the lateral tooth at its termination; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks not deep, rounded; nacre thick and pearly anteriorly, thin and iridescent posteriorly.

Remarks.—This species resembles the *scalenia* of Rafinesque, but more closely approaches the *patulus* (Nob.) and *truncatus** (Swainson). It differs from the *patulus* in the rays being uninterrupted, and in being much thicker. From the *truncatus* it differs greatly in the cardinal tooth and in being wedge shaped and not cylindrical.

---

* I will take advantage of this opportunity to correct an error, in stating in a former paper that Lamarck and other European conchologists erroneously made the genus Unio feminine. I should then have mentioned that Mr Swainson was an exception.

UNIO CUPRINUS. Plate XII. fig. 24.

Testâ ovatâ, transversâ, inæquilaterali, inflatâ, postico latere latissimo; valvulis tenuibus; natibus parvis undulatisque; dentibus cardinalibus exiguis, lateralibus laminatis; ligamento longo; margaritâ cupreâ.

Shell reversely ovate, transverse, inequilateral, inflated; valves thin; beaks small and undulated; cardinal teeth small; lateral teeth thin and lamellar; ligament long; nacre copper colour.

Hab. Mexico, J. R. Poinsett, Esq.
My Cabinet.
Cabinet of the American Philosophical Society.

Diam. ·9, Length 1·1, Breadth 2·1 inches.

Shell reversely ovate, transverse, inflated, disposed to be straight in the basal margin; substance of the shell thin; beaks small, pointed, furnished with concentric undulations and placed near the anterior margin; ligament long, lanceolate; umbonial slope large and rounded; posterior slope elevated into a carina; epidermis reddish brown and wrinkled; rays obsolete; cardinal teeth very small and tuberculated; lateral teeth slender, lamellar and nearly straight; anterior and posterior cicatrices both confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks wide; nacre copper colour and very brilliant towards the posterior margin.

Remarks.—This remarkable shell is one of the many fine specimens of the splendid collection of interesting subjects brought by our fellow member J. R. Poinsett, Esq. from Mexico, and which, by his munificence, now constitutes a valuable part of the collection of this society. In comparing this species with the others of the genus, we shall find it most to resemble the *complanatus* (Solan.). It differs however in having the posterior dorsal margin more elevated, in the peculiar copper colour of the nacre, and in the concentric undulations of the beaks. In the specimens which I have had an opportunity of examining, the anterior cicatrices were found to be confluent, a circumstance rarely met with in the Uniones.

UNIO CÆRULEUS. Plate XIII. fig. 25.

Testâ angusto-ellipticâ, transversâ, inæquilaterali, subcylindraceâ; valvulis tenuibus; natibus prominulis, rotundatis et undulatis; dentibus cardinalibus lamelliformibus, et in dextrâ valvulâ solâ duplicibus; lateralibus rectis; margaritâ cæruleo-albâ et iridescente.

Shell narrow-elliptical, transverse, inequilateral, subcylindrical; valves thin; beaks rather elevated, rounded and undulated; cardinal teeth lamelliform and double in the right valve only; lateral teeth straight; nacre bluish white, pearly and iridescent.

Hab. River Hoogly, Hindostan, G. W. Blakie.
My Cabinet.
Cabinet of G. W. Blakie.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of H. C. Carey.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Dr Burrough.

Diam. ·6, Length ·8, Breadth 1·6 inches.

Shell narrow-elliptical, transverse, subcylindrical, disposed to be straight on the sides and basal margin; substance of the shell thin; beaks near the anterior margin rounded, somewhat elevated, and corrugated with diverging undulations; ligament rather short and straight; epidermis finely wrinkled and bluish green, particularly on the posterior part; rays very indistinct; posterior slope furnished with small undulations and two irregular rays on each side; cardinal teeth lamelliform and double in the right valve only; lateral teeth straight and lamelliform; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices within the cavity of the beaks; cavity of the beaks wide and rounded; nacre bluish white, very pearly and iridescent.

Remarks.—This species was brought from Calcutta by Mr Blakie, to whose kindness I am indebted for it and many other fine shells.

As far as I have been able to ascertain, it has not been described. From the roughness of the beaks it might perhaps be thought to be only a variety of *corrugata* (Lam.). On comparing the two species, however, they will be found to be entirely distinct; the *corrugata* being "ovato-rhombeâ," while the *cæruleus* is "angusto-ellipticâ." In some specimens the nacre is slightly rose-coloured along the basal margin.

UNIO OBESUS. Plate XIII. fig. 26.

Testâ rhomboides-ovatâ, obliquâ, inæquilaterali, inflatâ; valvulis subcrassis; natibus prominulis; dentibus cardinalibus elevatis, compressis cristatisque; lateralibus longis et curvatis; margaritâ livido-albâ.

Shell ovate-rhomboidal, oblique, inequilateral, inflated; valves somewhat thick; beaks rather prominent; cardinal teeth elevated, compressed and crested; lateral teeth long and curved; nacre livid white.

Hab. York river, Vir., William Cooper.
My Cabinet.
Cabinet of Lyceum of Natural History of New York.
Diam. 1·5, Length 2, Breadth 3·3 inches.

Shell ovate-rhomboidal, oblique, inflated, angular behind; substance of the shell somewhat thick; beaks rather prominent and placed near the anterior margin; posterior slope wide and furnished with two impressed lines on each side; ligament long and large; epidermis fuscous and much wrinkled; rays obsolete; cardinal teeth oblique, elevated, lamellar, crested, deeply cleft in the left valve; lateral teeth long, curved and enlarged towards the posterior termination; anterior cicatrices distinct; posterior cicatrices disposed to be distinct; dorsal cicatrices form a row across the cavity of the beaks; cavity of the beaks rounded and deep; nacre livid white and iridescent on the posterior margin.

Remarks.—This is one of the specimens so disinterestedly contributed to our Transactions by the Lyceum of Natural History of New

York. Its natural situation seems to be between the *cariosus* (Say), and *complanatus* (Solan.). It has the capaciousness of the former, and somewhat of the outline of the latter.

UNIO INCURVUS. Plate XIII. fig. 27.

Testâ ovato-rhombeâ, transversâ, inæquilaterali; valvulis antice crassis, postice tenuibus; natibus rugosis, prominentibus incurvisque; dentibus cardinalibus elevatis cristatisque, lateralibus longis et subcurvis; margaritâ albâ et iridescente.

Shell ovate-rhomboidal, transverse, inequilateral; valves thick anteriorly and thin posteriorly; beaks rugose, prominent and incurved; cardinal teeth elevated and crested; lateral teeth long and slightly curved; nacre pearly white and iridescent.

Hab. ***. From Gibraltar, Mrs Mawe.
My Cabinet.

Diam. 1, Length 1·4, Breadth 2.1 inches.

Shell ovate-rhomboidal, transverse, slightly inflated; substance of the shell thick and white anteriorly, thin and iridescent posteriorly; beaks prominent, large, incurved and rugose, with small concentric undulations: ligament rather short and thick; epidermis yellowish brown; rays oblique and green; cardinal tooth elevated, crested and divided in the left valve, in the right simple and recurved; lateral tooth long, slightly curved and enlarged at posterior termination; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks wide and angulated; nacre white on the anterior, and iridescent on the posterior portion.

Remarks.—This shell, although it possesses no very striking character, cannot be placed with any American or exotic described species with which I am acquainted. It was sent to me by Mrs Mawe with the locality "from Gibraltar" on the label, and I have little doubt but that it came from some neighbouring African river. It certainly does not belong to any described European species. It bears more resemblance to the *corrugata*, Var. *a* (Lam.), than to any other species I have seen. It differs, however, in being more transverse, in the beaks being more prominent, and in their rugosities being composed of concentric undulations.

SYMPHYNOTA BILINEATA. Plate XI. fig. 19.

Testâ subellipticâ, transversâ, inæquilaterali, compressâ; valvulis tenuissimis; posteriori margine dorsali elevatâ connatâque; natibus subprominulis, undulas concentricas et duas lineas elevatas ad marginem posteriorem currentes, habentibus; dentibus cardinalibus laminatis et in valvulâ dextrâ solum duplicibus; lateralibus rectis; margaritâ colore salmonis subtinctâ.

Shell subelliptical, transverse, inequilateral, compressed; valves very thin, posterior dorsal margin elevated and connate; beaks very slightly elevated, concentrically undulate and possessing two elevated lines which pass to the posterior margin; cardinal teeth lamelliform and double in the right valve only; lateral teeth straight; nacre slightly salmon coloured.

Hab. River Hoogly, Hindostan, G. W. Blakie.
My Cabinet.
Cabinet of G. W. Blakie.
Cabinet of Dr Burrough.
Cabinet of the Academy of Natural Sciences.

Diam. ·3, Length ·7, Breadth 1·3 inches.

Shell subelliptical, transverse, inequilateral, compressed, diaphanous; substance of the shell extremely thin; beaks very slightly elevated, concentrically undulate, possessing two small elevated lines which pass (posterior to the umbonial slope) to the posterior margin; valves elevated into a carina and connate in the posterior dorsal margin; dorsal margin a right line; ligament very small; epidermis shining, greenish yellow, darker on the posterior slope; cardinal teeth lamelliform and double in the *right* valve only; lateral teeth lamelliform, long and straight; posterior and anterior cicatrices both confluent; dorsal cicatrices obsolete; cavity of the beaks shallow, very wide, and exhibiting the undulations of the beaks; nacre very thin and slightly salmon coloured, darker in the cavity of the beaks.

Remarks.—This very small species was brought from Calcutta by Mr Blakie, with the *U. cæruleus* (Nob.). Both were procured about one hundred miles above that city. It resembles, in its outward characters, the young of *S. cygnea* (*Anod. cygnea*, authors). It is, however, more transverse, and differs altogether in the formation of the hinge, which is furnished with perfect cardinal and lateral teeth. In the peculiar character of the *double tooth* in the *right* valve, it resembles the *S. ochracea.*[*] The *bilineata* is easily distinguished by the two delicate lines which pass from the beaks to the posterior margin.

SYMPHYNOTA INFLATA. Plate XIV. fig. 28.

Testâ ovato-triangulari, inæquilaterali, ventricosâ; valvulis pertenuibus, connato-bialatis; dente cardinali in valvulâ singulâ unico; dentibus lateralibus ad terminos laminatis; natibus prominulis; ligamento celato; margaritâ purpureâ.

Shell triangular-ovate, inequilateral, ventricose; valves very thin, elevated into two wings, both of which are connate; cardinal tooth single in both valves; lateral teeth bladed towards their termination; beaks slightly prominent; ligament concealed; nacre purple.

Hab. Alabama river, Judge Tait.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of the Academy of Natural Sciences.

Diam. 1·6, Length from the beaks to the base, 2·4, Breadth 4·5 inches. Length from the top of the wing to the base, 3·7 inches.

Shell triangular-ovate, ventricose, transversely and finely wrinkled; substance of the shell thin; valves elevated into a broad high wing posterior, and a small one anterior to the beaks, and connate in both; posterior wing recurved at top; beaks slightly prominent; ligament concealed in the wing; epidermis brown, with obsolete rays; two or three fuscous lines pass from the beak to the posterior margin above the umbonial slope; cardinal tooth single in both valves, and lamelliform; lateral teeth bladed and elevated towards their termination; the two teeth form one continuous curve line (with the exception of a slight angle where they join) which is abrupt at both ends; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices pass from the cavity towards the anterior cicatrices, and are very perceptible; cavity of the beaks wide and shallow; nacre purple and iridescent.

---

[*] See page 69.

Remarks.—I am indebted, for this fine shell, to Judge Tait of Alabama, who kindly sent it to me with several other new species of fluviatile and terrestrial shells described in this paper. This species seems to form a natural link between *S. lævissima* (Nob.) and *S. bialata* (Nob.). It resembles the former in colour and in the teeth, but differs in the elevation of the wing, and in being less shining and more ventricose. It resembles the latter in its elevated wing and general outline, but differs from it in nacre, exterior colour, in not being possessed of undulations along the base of the posterior wing, and in the teeth.

MELANIA SUBULARIS. Plate XV. fig. 30.

Testâ elevatâ, turritâ, corneâ; apice acuto; anfractibus instar duodenis, planis; anfractu infimo in medio carinato; aperturâ albâ, quadrante longitudinis testæ.

Shell elevated and acutely turrited, horn colour; apex acute; whirls about twelve, flat, carinate on the middle of the body whirl; base angulated; aperture white and one-fourth the length of the shell.

Hab. Niagara river.

My Cabinet.

Diam. ·4, Length 1·3 inches.

Remarks.—I took this species at the Falls of Niagara, and being unable to refer it to any described species, have given it a place here. It resembles the *virginica* (Say), but differs greatly in elevation, the *virginica* having about seven whirls only. The carina causes the whirls to be flatter in the subularis. In some specimens the columella is purple.

MELANIA TUBERCULATA. Plate XV. fig. 31, a, b.

Testâ obtuse turritâ, latâ, tenebroso-fuscâ aut nigrante; apice obtuso; anfractibus quinque; medio anfractûs ultimi tuberculis instructo; labro enormiter curvo; basi angulatâ; aperturâ purpureâ, dimidium longitudinis testæ habente.

Shell obtusely turrited, wide, very dark brown or black; apex obtuse; whirls five; middle of the last whirl furnished with tubercles; outer lip irregularly curved; base angulated; aperture purple and one half the length of the shell.

Hab. Tennessee river, Professor Vanuxem.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of Academy of Natural Sciences.
Diam. ·5, Length ·9, of an inch.

Remarks.—This species is somewhat allied to the *M. armigera* (Say), but is smaller and much less ponderous. The tubercles are more numerous and less elevated. In the *tuberculata* the impressed band, which exists in the *armigera* above the armature, is wanting. In colour it differs altogether.

MELANIA ACUTA. Plate XV. fig. 32.

Testâ acute turritâ, tenui, corneâ; apice acuto; anfractibus octo, supra suturam carinatis, in longum undatis, transversim lineatis; basi angulatâ; aperturâ albâ, quadrantem longitudinis testæ habente.

Shell acutely turrited, thin, horn-coloured ; apex acute ; whirls eight, carinate immediately above the suture, longitudinally undulated and transversely lineated ; base angulated ; aperture white, and one-fourth the length of the shell.

Hab. Tennessee river, Professor Vanuxem.
My Cabinet.
Cabinet of Prof. Vanuxem.
Diam. five-twentieths, Length thirteen-twentieths of an inch.

Remarks.—I have seen no described species to which this bears a close resemblance. Its delicate form, furnished with undulations and transverse lines, will easily distinguish it.

HELIX CAROLINIENSIS. Plate XV. fig. 33, a, b, c.

Testâ supra depressâ, infra inflatâ, oblique striatâ, fuscâ, imperforatâ; anfractibus quinque; spirâ maxime obtusâ; aperturâ coarctatâ; labro albo, reflexo, latoque, duobus dentibus instructo, quorum inferior longus et laminatus, superior parvus et conicus est; columellâ dentem levatum incurvumque habente; columellæ basi valde impressâ.

Shell depressed above, inflated below, obliquely striated, fuscous, imperforate ; whirls five ; spire very obtuse ; aperture contracted ; outer lip white, broad and reflected, furnished with two teeth, the inferior one long and lamellar, the superior one small and conical ; columella with an elevated incurved tooth ; base of the columella much impressed.

Hab. South Carolina near Cheraw.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Diam. fourteen-twentieths, Length seven-twentieths of an inch.

Remarks.—I found a few specimens of this fine *Helix* while travelling through South Carolina three years since. They were taken from beneath the bark of an old tree. It is closely allied to Mr Say's *pal-*

liata, but differs in the region of the base of the columella being more deeply impressed. The oblique striæ are more distinct, and no specimen which I obtained is in the least hirsute.

CAROCOLLA HELICOIDES. Plate XV. fig. 34, a, b, c.

Testâ orbiculâtâ, fuscâ, suprà plano convexâ, subtus inflatâ, imperforatâ, oblique striatâ; anfractibus quinque; spirâ obtusissimâ; aperturâ contractâ; labro albo, lato et reflexo, dentibus duobus instructo, quorum inferior longus et laminatus, superior parvus et conicus est; columellâ dentem unicum, longum, elevatum et incurvum habente.

Shell orbicular, fuscous, plano-convex above, inflated below, imperforate, obliquely striated; whirls five; spire very obtuse; aperture contracted; outer lip white, broad, and reflected, furnished with two teeth, the inferior one long and lamellar, the superior one small and conical; columella with a long, elevated, incurved tooth.

Hab. Tennessee, near Nashville, Professor Vanuxem.
My Cabinet.
Cabinet of Professor Vanuxem.

Helix palliata? Say, Var. *a*, Academy of Natural Sciences, Vol. II, p. 152.

Diam. eighteen-twentieths, Length nine-twentieths of an inch.

Remarks.—Among the fine shells brought by Professor Vanuxem some years since from a tour through the Western states were two specimens of this beautiful Carocolla. In its specific characters it resembles the *Helix palliata* of Say, and *Helix caroliniensis* described in this paper. It is destitute of the hirsute appearance of the *palliata*, and is entirely distinct in the flatness of the whirls of the spire. In the *caroliniensis* the base of the columella is more impressed and the whirls more inflated.

CAROCOLLA SPINOSA. Plate XV. fig. 35, a, b, c.

Testâ lenticulari, tenui, pellucidâ, imperforatâ; carinâ acutâ et spinis minutis munitâ; anfractibus sex; spira fere plana; apertura angustissima; columella dentem unicum longum et laminatum habente; labro enormiter crasso et prope finem superiorem angulato.

Shell lenticular, thin, diaphanous, imperforate; carina acute and armed with minute spines; whirls six; spire nearly planular; aperture linear, being guarded by a long tooth on the columella; outer lip irregularly thick, angulated near the superior termination.

Hab. Alabama near Clairborne, Judge Tait.
My Cabinet.
Cabinet of the Academy of Natural Sciences.
Diam. eleven-twentieths, Length four-twentieths of an inch.

Remarks.—For this beautiful and highly interesting species I am indebted to the kindness of Judge Tait. Its peculiar delicate spines distinguished it from all described species. These, however, when the specimens are not perfect, are entirely obliterated. In the construction of the aperture it is unlike every *Carocolla* I have seen, bearing much resemblance in this region to the *Helix hirsuta* (Say).

VALVATA ARENIFERA. Plate XV. fig. 36, a, b.

Testâ orbiculatâ, convexâ; anfractibus tribus, qui arenis agglutinatis operiuntur; umbilico lato; spirâ obtusâ.

Shell orbicular, convex; whirls three, covered by the agglutinations of sand; umbilicus wide; spire obtuse.

Hab. Cumberland river near Nashville, W. Cooper.
My Cabinet.
Cabinet of W. Cooper.

Cabinet of the Lyceum of Natural History of New York.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Diam. five-twentieths, Length four-twentieths of an inch.

Remarks.—This very curious and interesting species was among the fresh water shells so disinterestedly sent to me by the Lyceum of Natural History of New York to be examined and inserted in this paper. It has the singular property of strengthening its whirls by the agglutination of particles of sand, &c. by which it is entirely covered, and in this character it resembles the *Trochus agglutinans*, Lam. (*Trochus conchyliophorus*, Authors.) The apex in all the specimens which I have had an opportunity of examining is broken. The operculum was observed in two specimens sufficiently perfect to exhibit a striated horny structure.

SUPPLEMENT.

Read before the American Philosophical Society, May 20th, 1831.

SINCE my Memoir, read before the Society last May, went to press, I have procured several species which I believe to be undescribed; and which I now propose to add as a supplement, with some preliminary observations.

Having had an opportunity to examine many fine specimens within a few months, particularly those brought to this city by James Ronaldson, Esq. to whose kindness I am indebted for some very rare species, I have had an opportunity of observing some colouring of the nacre which is exceedingly beautiful and rare. It is a singular fact, that several species, which may be considered, emphatically, as white in the nacre, vary slightly by being possessed, very rarely, of a tint of pink in the lateral and sometimes in the cardinal tooth or in the centre of the valve. In the cabinets of W. Cooper, Esq. and Mr R., as well as my own, are specimens of *U. cylindricus* whose pearly teeth are beautifully tinged with the most delicate and beautiful pink. The same cabinets possess also the *U. securis* with the lateral tooth tinted in the same manner. The *U. metanever* has sometimes, though very rarely, a tint of pink, and still more rarely of nankeen yellow in the centre of the beaks. The *U. circulus*, as observed in a previous memoir, is sometimes, though rarely, possessed of a pink tint.

Whether all the species with white nacre may sometimes be possessed of this beautiful variety remains to be observed. These rare and beautiful variations will undoubtedly, when our cabinets shall be possessed of all the rare species, constitute the jewels of our collections and be exceedingly sought after.

The size to which some of the species of the *Naiades* grow is exceedingly great. I have in my cabinet the following species, of the weight and size annexed:

		Inches.		*Inches.*		*lb.*	*oz.*
U. plicatus,	length	4·6,	breadth	6·8,	weight	1	10.
U. multiplicatus		4·9,		6·2,		1	7.
Symphynota alata*		4·2,		7·1,		0	11.
Symphynota complanata†		5·1,		7·2,		0	15.

Nearly all the specimens which I have seen of the *U. soleniformis* (nobis) were sent from Louisville. It struck me as somewhat singular, that a species so fragile should exist about the falls of a large river, the force of whose waters there is well known. In explanation of this, I have been informed by Mr T. W. Taylor of that city, that they are found to congregate under large flat stones. Unacquainted with this fact he searched in vain for a long time without finding a single alive specimen, while odd valves were not uncommon. They were first discovered in this situation by raising a stone to take a common crawfish, which had taken refuge there. This character seems to be peculiar to this species.

My sister, Mrs Febiger of Cincinnati, mentioned to me a peculiarity in the habits of the *Unio oriens*. This shell is possessed of so small a portion of nacre, that in some specimens the epidermis may be said to be as thick as the nacre itself. It is obvious therefore that the rolling of stones and sand carried by the rapidity of the current of the Ohio upon them, would destroy them if they took the same position with other species embedded merely in the surface of the sand. This they avoid, and, burying themselves from six to twelve inches in the sand, can only be discovered by a small round hole at the surface through which they receive their supply of water.

---

* Unio alatus, Say.

† Alasmodonta complanata, Barnes.

In the description of *U. varicosus**, I ought to have mentioned that I did not hesitate to make use of that name, although already used by Lamarck, having no doubt but that his species was the *Alasmodonta undulata*† (Say).

When making some observations on the family *Naiades*, Vol. III. p. 442, I mentioned in a note upon the genus *Castalia*, that it must be considered as a species of the genus *Unio*. Having recently procured from Paris a perfect specimen of it, I have given it a close examination, and do not now feel by any means certain that it ought not, *in the present received division of the family*, to be considered a distinct genus. The crenulations of the cardinal and lateral teeth in this specimen are very distinct, which was not the case in the single valve which I formerly examined. In this character it has a slight approach to the family *Arcacea;* and Lamarck very justly says, "comme elle semble fluviatile‡, elle indique que les trigonées forment une transition des arcacées aux nayades."

Lamarck, in his description of the *Castalia*, makes no mention of the position or existence of the muscular impressions of this genus. In examining this character, I have discovered that the same observations made at page 67, in relation to the cicatrix of the extensor muscles of the *Hyria avicularis*, will equally well apply to the genus *Castalia*, and it is very remarkable that it should be so differently situated from the same cicatrix in the genus *Unio*.

---

* See Vol. IV. p. 90.

† See Vol. III. page 424.

‡ There cannot be a doubt of its being fluviatile.

In ascribing the locality of York river, Virginia, to the *U. obesus*, I have reason to believe there is an error. It was so labelled in the collection of the Lyceum of Natural History of New York; but this, Major Le Conte assures me, must have been done by some transfer or accidental change of the labels; as he procured them in Georgia, from whence he recently obtained a new supply of undoubtedly the same species, and those marked as from York river cannot be traced to that locality. The locality was a matter of surprize to me when I received them as coming from that river.

Unio Olivarius. Plate XVI. fig. 38.

Testâ ovatâ, transversâ, inflatâ, pellucidâ; valvulis pertenuibus; natibus prominulis; epidermide pertenui, lævi et olivæ colorem habente; dentibus cardinalibus magnis laminatis erectisque, lateralibus laminatis brevibusque; margaritâ pertenui albâque.

Shell ovate, transverse, inflated, pellucid; valves very thin; beaks slightly elevated; epidermis olive, very thin and smooth. Cardinal teeth large, erect and lamelliform; lateral teeth short and lamelliform; nacre very thin, white and pearly.

Hab. Burrill river, India, Dr Burrough.
My Cabinet.
Cabinet of Dr Burrough.
Cabinet of the Academy of Natural Sciences.
Cabinet of Dr Morton.

Diam. ·7, Length ·8, Breadth 1·5 inches.

Shell ovate, transverse, inequilateral, inflated, pellucid: substance of the shell very thin; beaks slightly elevated, rounded and devoid of undulations: ligament very small: epidermis olive, very thin and smooth: rays obscure, cardinal teeth large, erect and lamelliform; lateral teeth short and lamelliform: anterior cicatrices slightly confluent: posterior cicatrices confluent: dorsal cicatrices not perceptible; cavity of the beaks wide; nacre very thin and bluish white.

Remarks.—This interesting little shell is from the fine collection made by Dr Burrough during his travels in India, and I am indebted to his kindness for the specimen figured. It is a perfectly distinct species, and may easily be recognised by its form, its pellucidness, and its smooth olive-coloured epidermis. It somewhat resembles a young *Anodonta* on the exterior, but the elevated lamelliform teeth easily distinguish it from that genus. Its resemblance to a Spanish olive is very striking.

UNIO PYRAMIDATUS. Plate XVI. fig. 39.

Testâ sub-pyramidatâ, longitudinali, inflatâ; valvulis antice crassioribus; natibus maxime prominentibus, recurvis; dentibus cardinalibus magnis crenatisque; lateralibus longis, a cardinalibus separatis, ad baseos marginem vergentibusque; margaritâ colorem carnis habente.

Shell sub-pyramidal, longitudinal, inflated; valves thick anteriorly, thinner posteriorly; beaks very much elevated, recurved; cardinal teeth large and crenate; lateral teeth long, distinct from the cardinal teeth and pointing towards basal margin; nacre flesh colour.

Hab. Ohio, T. G. Lea.

My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of P. H. Nicklin.
Unio undatus? Barnes, Var. *a.*

Diam. 1·7, Length 2·3, Breadth 2·1 inches.

Shell sub-pyramidal, longitudinal, inequilateral, anterior part swollen recurvely from the beaks to the basal margin, compressed at posterior margin, slightly depressed anterior to umbonial slope; substance of the shell very thick in the region of the teeth and beaks, thin at posterior margin; beaks very much elevated, recurved and incurved; epidermis very dark brown and finely wrinkled; cardinal teeth large, crenate and deeply impressed in the left valve, single and emerging from a pit in the right; lateral teeth long, slightly curved, distinct from the cardinal teeth and pointing towards the basal margin; anterior cicatrices distinct, the great one forming a deep pit; posterior cicatrices distinct, the smaller one being placed at the end of the lateral tooth; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks deep and angulated; nacre beautifully flesh coloured, very rarely white.

Remarks.—This very beautiful and interesting shell has heretofore been considered as the *U. mytiloides* (Rafin.). It does not however answer either to the description or figure of that author. It may be easily distinguished from any described species of this genus by its exceedingly elevated beaks, and beautiful nacre. In young individuals, indistinct rays may be observed on the beaks.

UNIO TRIGONUS. Plate XVI. fig. 40.

Testâ subtriangulari, inflatâ, præclivo umboniali (quod carinatum est), depressâ; valvulis crassis, natibus prominentibus, incurvis; dentibus cardinalibus magnis, lateralibus magnis et subcurvis; margaritâ albâ et iridescente.

Shell subtriangular, inflated, depressed before the umbonial slope which is carinate; valves thick; beaks prominent, incurved; cardinal teeth large; lateral teeth large and slightly curved; nacre pearly white and iridescent.

Hab. { Ohio river at Cincinnati, T. G. Lea.
Ohio river at Louisville, T. H. Taylor.

My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of J. Ronaldson.
Cabinet of the Academy of Natural Sciences.

Diam. 1·5, Length 2, Breadth 2·3 inches.

Shell subtriangular, inflated, nearly equilateral, depressed before the umbonial slope, angular behind; umbonial slope carinate; basal margin emarginate; substance of the shell thick, beaks prominent, incurved, and slightly undulated at the tips; ligament short and thick; epidermis brown; rays obsolete; cardinal tooth large, elevated and widely cleft in the left valve and emerging from a pit in the right valve; lateral teeth thick and curved in a direction over the cardinal tooth; anterior and posterior cicatrices both distinct; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks deep and angular; nacre pearly white and iridescent.

Remarks. This is rather a rare shell, and being of a group of the species which are known under the general name of *Mytiloides* (Rafin.), it has been considered merely a variety of that species. Having recently examined this group with very close attention and with the advantage of very many specimens, I am induced to believe that it may with great propriety be divided into four species, viz. *mytiloides* (Rafin.), *undatus* (Barnes), *pyramidatus* (Nobis), and *trigonus*.

UNIO FORMOSUS. Plate XVI. fig. 41.

Testâ triangulari, ventricosâ, transversâ; clivo posteriori subplano; radiis irregularibus, interruptis, subacutis; dentibus cardinalibus magnis, lateralibus brevibus subrectisque; margaritâ albâ.

Shell triangular, ventricose, transverse, nearly flat on the posterior slope; rays irregular, interrupted, and somewhat pointed; cardinal teeth large; lateral teeth short and nearly straight; nacre pearly white.

Hab. Ohio river, T. G. Lea.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of the American Philosophical Society.
Cabinet of the Academy of Natural Sciences.
Cabinet of Peale's Museum.

Diam. 1, Length 1·1, Breadth 1·6 inches.

Shell triangular, ventricose, transverse, inequilateral; posterior slope wide, nearly forming a plane, and possessing numerous indistinct ribs; substance of the shell somewhat thick; beaks somewhat prominent and flattened; ligament short; epidermis yellowish, smooth and shining; rays numerous, irregular, interrupted and pointed somewhat like an arrow head, on the posterior slope they are very minute; umbonial slope carinate; cardinal teeth large and double in both valves; lateral teeth short, nearly straight and enlarged at posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks deep and rounded; nacre pearly white.

Remarks.—This beautiful shell has heretofore been considered as a variety of *U. triangularis* (Barnes). It has, however, I think, characters sufficiently distinctive to entitle it to rank among the species. It differs from that species essentially in being less flat on the posterior slope, in the umbonial slope being carinate and not rounded, in being less transverse and in possessing a sharper edge along the basal margin. In the *triangularis* the greatest transverse diameter is nearer the basal margin than in this species. It is sometimes found much larger than the specimen here represented, which is selected on account of its perfection. My largest specimen would weigh at least four times as much as this one.

UNIO PERPLEXUS. Plate XVII. fig. 42.

Testâ ovatâ, obliquâ, nodulorum seriem irregularem (fere mediis in valvulis) à natibus ad marginem baseos currentem habente; valvulis crassis; clivo umboniali irregulariter rugato; radiis exiguis et numerosis; dentibus cardinalibus modicis, lateralibus longis subrectisque; margaritâ lacteo-albâ.

Shell ovate, oblique, having an irregular nodulous line near the middle from the beaks to the basal margin; valves thick; umbonial slope irregularly wrinkled; rays small and numerous; cardinal teeth rather small; lateral teeth long and nearly straight; nacre milk white.

Hab. Ohio river, T. G. Lea.

My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.
Cabinet of the Academy of Natural Sciences.
Cabinet of the American Philosophical Society.

Diam. 1·5, Length 1·9, Breadth 2·6 inches.

Shell ovate, oblique, inequilateral, having an irregular nodulous line near the middle passing obliquely from the beaks to the basal margin; substance of the shell thick; umbonial slope irregularly wrinkled; anterior to the umbonial slope is a wide slightly impressed furrow; beaks prominent, rounded, and situated near the anterior margin; ligament slender and somewhat long; epidermis smooth, shining, yellowish, with numerous small green rays which thickly cover the whole disk except a small portion of the anterior part; cardinal teeth rather small, deeply cleft in the left valve, single and emerging from a pit in the right valve; lateral teeth long, nearly straight, and slightly enlarged near the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks wide and rounded; nacre milk white, rarely rose coloured.

Remarks.—This extraordinary and highly interesting shell formed one of the three divisions into which I had, in my cabinet, separated the *U. cornutus* (Barnes). The other division has been called by Dr Hildreth *foliatus.* Having, since the publication of my last memoir*, received numerous young and perfect specimens, I have concluded that the study of this group would be facilitated by its separation into three species, which will stand thus; *U. cornutus* (Barnes), possessing three or four distinct horns between the beaks and basal margin; *U. foliatus* (Hildreth), having no elevation, but possessed of two elongations, one at the basal margin, the other at posterior margin; and *U. perplexus* (Nob.), possessed of an irregular oblique nodulous ridge passing from the beaks to basal margin. The figure represents a perfect and beautiful specimen. It sometimes occurs, however, with an extended posterior portion so large as to be nearly as wide again as the natural width of the shell. The pallial impression, nevertheless, does not advance beyond its natural position, and the space beyond is covered by a prolonged and hard portion of the fringe of the mantle. The irregularity of the nodules is very remarkable and varies from one on each valve to twelve. Where there are few, they are generally much elevated, and there being a correspondent depression in the other valve the specimen presents a remarkable, and distorted appearance. Specimens are occasionally found of a beautiful rose colour. These, however, are very rare.

---

* See note, Vol. III. p. 418.

Unio Angustatus. Plate XVII. fig. 43.

Testâ transversâ, sub-compressâ, angusto-ellipticâ; valvulis tenuibus; natibus prominulis et apicibus undulatis; radiis obsoletis; dentibus cardinalibus elevatis et compressis, lateralibus longis, subrectisque; margaritâ purpureâ et iridescente.

Shell transverse, somewhat compressed, narrow-elliptical, valves thin; beaks slightly elevated and undulated at the tips; very obsolete; cardinal teeth elevated and compressed; lateral teeth long and nearly straight; nacre purple and iridescent.

Hab. { Congaree river, South Carolina.
Cooper river, South Carolina, Professor Ravenel.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of Professor Ravenel.
Cabinet of Major Le Conte.
Cabinet of the Academy of Natural Sciences.

Diam. 7, Length 1·1, Breadth 2·8 inches.

Shell very transverse, somewhat compressed, very narrow-elliptical, inequilateral; substance of the shell thin; beaks slightly elevated and undulated at the tips; ligament long and slender; epidermis reddish brown, rays obsolete; cardinal teeth elevated, compressed and crenulate; lateral teeth long, nearly straight and enlarged at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated in the angle of the cavity of the beaks; cavity of the beaks wide and shallow; nacre dull purple.

Remarks.—This species resembles somewhat the *Unio complanatus* (Soland.). It will, however, at once be distinguished by its great proportionate breadth. In this it resembles the *U. nasutus* (Say), but may be readily separated from that species by its want of the peculiar rays of the *nasutus* and the absence of its posterior enlargement. In the summer of 1827, I found several young and striking specimens of this species in the Congaree at Columbia, S. C. and I am recently indebted to Professor Ravenel for several adult specimens, one of which is represented in the plate. In some specimens the umbonial slope is more elevated and the basal margin straight.

I have a single specimen nearly white in the nacre; and they will, most probably, be found of a salmon colour, as well also of all the tints between these colours, similar to the *U. complanatus* with which and some other it seems to form a natural group*.

---

* Extract from a letter recently received from Professor Ravenel. " I have been fortunate enough to obtain very good series of the two shells which I was anxious to submit to your examination, as well as a complete series of the *complanatus* in all the varieties in which it occurs in Cooper river and its tributary streams. This will enable you to compare the *lengthened* shell [the above described species] which I thought distinct, with such specimens of the *complanatus* as approach it, and to determine the point. Our shell resembles the *nasutus* closely, particularly the young shell, but is certainly distinct from it. I have never seen the *nasutus* in this state or in North Carolina."

Charleston, South Carolina, May 27th, 1831.

UNIO ARCÆFORMIS. Plate XVII. fig. 44.

Testâ arcæformi, valde ventricosâ, transversâ; clivo posteriori latissimo et sulcum curvum habente; valvulis præcrassis; radiis capillaribus; dentibus cardinalibus crassis, lateralibus brevibus rectisque; margaritâ albâ.

Shell arcæform, very ventricose, transverse; posterior slope very wide and possessed of a curved furrow; valves very thick; rays hair-like; cardinal teeth thick; lateral teeth short and straight; nacre white.

Hab. Tennessee river, Professor Vanuxem.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of W. Cooper.

Diam. 2, Length 2, Breadth 2·5 inches.

Shell subtriangular, very ventricose, transverse, inequilateral; posterior slope very wide, and nearly flat except at the termination of the ligament, possessed of a curved furrow enlarging from the beaks to the posterior margin; substance of the shell very thick; beaks prominent and incurved; ligament short and thick; epidermis yellowish brown; rays hair-like and numerous; cardinal teeth thick and irregular; lateral teeth short, straight and crenate; posterior cicatrices confluent; anterior cicatrices distinct; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks shallow and rounded; nacre white.

Remarks.—I have been in possession of a single specimen of this species for some years. It was brought by Professor Vanuxem from the Tennessee river, and, being old, some of its characters have nearly disappeared. I frequently examined it with great interest, and felt persuaded it was a new species, although it strongly resembled the *triangularis* (Barnes). A young and an adult specimen, recently sent me from New York by that excellent naturalist W. Cooper, proves it beyond a doubt to be a distinct species. In its rays it differs altogether from the *triangularis;* it is dissimilar also in the thickness of the valves and in the possession of two remarkable curved furrows on the umbonial slope. The specimen represented in the engraving is chosen on account of its being adult, although the beaks are not in a perfect state of preservation. The enlargement and dentate appearance of the posterior margin is very remarkable in this and some other of the species. It occurs more frequently in the *sulcatus* (Nobis), and has been particularly noticed in the remarks on that species*. This variety of *sulcatus* has been considered by Mr Say as a distinct species, to which he has given the name of *ridibundus*. I have never thought that it could be considered to differ specifically from the *sulcatus*.

UNIO SUBROTUNDUS. Plate XVIII. fig. 45.

Testâ suborbiculatâ, subventricosâ; valvulis crassis; natibus prominentibus; epidermide circa nates luteâ, juxta marginem fuscâ; radiis interruptis; dentibus cardinalibus crassis, lateralibus subcurvis brevibusque; margaritâ albâ et iridescente.

Shell suborbicular, subventricose; valves thick; beaks elevated; epidermis yellow about the beaks, brown towards the margin; rays interrupted; cardinal teeth thick; lateral teeth short and slightly curved; nacre pearly white and iridescent.

Hab. Ohio, T. G. Lea.

My Cabinet.

Diam. 1·1, Length 1·6, Breadth 1·6 inches.

Shell suborbicular, nearly equilateral, subventricose; substance of the shell thick, somewhat thinner behind; beaks thick and elevated; ligament rather short and thick; epidermis yellow and smooth in the region of the beaks; brown and finely wrinkled towards the margin; interrupted rays pass from the beaks and are very visible over the umbones, but are lost in the wrinkles before they reach the margin; cardinal teeth thick and crenate; lateral teeth short, thick and very slightly curved; posterior and anterior cicatrices both distinct; dorsal cicatrices situated on the under side of the cardinal teeth; cavity of the beaks deep and angulated: nacre pearly white and iridescent.

---

* See Vol. III. p. 431.

Remarks.—Among the numerous shells I have received within the last five years from our western waters, I have obtained but three or four of this interesting species. Its extreme rarity at first induced me to doubt of the propriety of considering it a distinct species. It is however, perfectly distinct from any described species and seems peculiar in its yellow beaks and brown margin; as well as in the beautiful interrupted rays which pass over the umbones, leaving the anterior and posterior slopes usually of a yellow colour. In form it approaches the *ebenus* (Nobis), in colour it more nearly resembles the *undatus* (Barnes). A young individual of not more than three growths presents such a shining and yellow epidermis as to resemble very much a small *Venus*.

UNIO SUBOVATUS. Plate XVIII. fig. 46.

Testá subovatâ, transversâ, inflatâ; valvulis crassis; natibus prominentibus et apicibus undulatis; multis radiis viridibus; dentibus cardinalibus erectis et in valvulâ utrâque duplicibus, lateralibus laminatis brevibusque; margaritâ albâ.

Shell subovate, transverse, inflated; valves thick; beaks elevated and undulated at the tip; rays green and numerous; cardinal teeth double in both valves and erect; lateral teeth short and lamelliform; nacre white and very pearly.

Hab. Ohio river, T. G. Lea.
My Cabinet.
Cabinet of John Ronaldson.
Cabinet of the Academy of Natural Sciences.

Diam. 2·2, Length 3, Breadth 4·2 inches.

Shell subovate, transverse, inequilateral, inflated; substance of the shell thick; beaks elevated, incurved and undulated at the tips; ligament short and thick; epidermis yellowish with numerous green rays passing obliquely from the beaks to the margin; cardinal teeth large, double in both valves, very erect and deeply cleft in both valves; lateral teeth short and lamelliform; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated within the cavity of the shell on the under part of the cardinal tooth and on the plate between the cardinal and lateral teeth; cavity of the beaks very large and rounded; nacre white and very pearly.

Remarks.—This species is very closely allied to the *U. ovatus* (Say) and *U. occidens* (Nobis). It differs constantly, however, from both, in being more produced posteriorly, and in the position of the beaks which are placed nearer the anterior margin. It is less flattened on the posterior slope than the *ovatus*, and less carinate than the *occidens*. Like both these species the anterior section of the cardinal teeth is the most elevated. In some specimens no rays are observable*.

UNIO PILEUS. Plate XVIII. fig. 47.

Testâ subtriangulari, ventricosâ, præclivo umboniali in longum subsulcatâ, emarginatâ; valvulis crassis; radiis capillaribus; dentibus cardinalibus magnis, lateralibus breviusculis subcurvisque; margaritâ albâ et iridescente.

Shell subtriangular, ventricose, slightly emarginate, longitudinally furrowed in front of the umbonial slope; valves thick; rays hair-like; cardinal teeth large; lateral teeth rather short and slightly curved; nacre pearly white and iridescent.

---

* Since this supplement went to press I have seen in the fine collection of that excellent conchologist, Mr W. Hyde, a specimen sent him by Mr Barnes some years since as *U. ventricosus*. If this specimen be not of the same species as the above described, it certainly very closely resembles it. Never having seen the individual specimen described by Mr Barnes as *ventricosus*, I believed, from that part of the description in which he says "this shell is more capacious than any other of the genus hitherto described," that he meant the species known to us as *globosus*, and therefore I selected of the two species that which seemed to agree the least with his description, and figured and described it. Should it, upon further examination, prove that I have described the same shell with Mr Barnes, the name of *globosus* should be used to distinguish this capacious species, specimens of which are in the cabinets of Mr Hyde, the Academy of Natural Sciences, Peale's Museum, and in my own. Mr Barnes must, I think, be in error in supposing the *ventricosus* to inhabit the Delaware, or New Jersey near New York. I do not think that any of the group belong to our eastern waters.

Hab. Ohio river, near Cincinnati, Mrs Febiger.
My Cabinet.

Diam. 1·2, Length 1·8, Breadth 1·8 inches.

Shell subtriangular, angular behind and rounded before, ventricose; longitudinally furrowed in front of the umbonial slope, the furrow causing a slight emargination in the basal margin; umbonial slope flattened on the ridge; substance of the shell thick; beaks prominent and rounded at the tip; ligament short and thick; epidermis yellowish-brown and wrinkled; rays numerous and hair-like; cardinal tooth large, elevated and deeply cleft in the left valve, single and emerging from a pit in the right valve; lateral teeth short and slightly curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks wide and rounded; nacre pearly white and iridescent.

Remarks.—This shell has recently come into my possession and was taken near Cincinnati. It is different from any species I have seen, and somewhat resembles the *U. sulcatus* (Nobis), having a furrow from the beaks to the margin anterior to the umbonial slope. It differs from it, however, in being more elongated and in being destitute of a purple nacre. The disposition to flatness in the umbonial slope is remarkable in this species.

MELANIA ELONGATA. Plate XV. fig. 29.

Testâ elevatâ et acute turritâ, fusco-corneâ, purpureo-fasciatâ; anfractibus circiter decem parum depressis; basi angulatâ; aperturâ cœruleo-albâ, longitudinis testæ quadrantem habente.

Shell elevated and acutely turrited, dark horn colour with purple bands; apex acute; whirls about ten and slightly depressed; base angulated; aperture bluish-white and about one fourth the length of the shell.

Hab. West Tennessee, John Lea.
My Cabinet.
Diam. ·5, Length 1·5 inches.

Remarks.—This fine Melania seems most to resemble the *subularis* (Nobis). It differs from it in being wider, in being darker coloured, and in having a less number of whirls. The bands in some specimens are scarcely visible.

I cannot terminate this memoir without making my grateful acknowledgements to numerous friends for specimens sent from time to time for my examination or acceptance. To P. H. Nicklin, Esq. and to W. Cooper, Esq. I am under particular obligations, for their kind and prompt assistance on such difficult points as appeared to me to require consultation.

ARTICLE VI.

Description of a new genus of the family Melaniana of Lamarck. By Isaac Lea. Read January 7th, 1831.

FAMILY MELANIANA.

Genus Io.

Testâ fusiformi ; basi canaliculatâ ; spirâ elevatâ; columellâ concavâ lævique.

Shell fusiform ; base canaliculate; spire elevated; columella smooth and concave.

Io Fusiformis. Plate XV. fig. 37, a, b.

My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of Mr Say.
Cabinet of the Academy of Natural Sciences of Philadelphia.

Fusus fluvialis, Say, Journal of the Academy of Natural Sciences of Philadelphia, Vol. 5, p. 129.

Diam. ·9, Length 2·2 inches.

Remarks.—This very remarkable, interesting and rare shell was presented to me many years since by Professor Vanuxem, by whom only it has been found. Specimens were also presented by him to Mr Say and to the Academy of Natural Sciences of Philadelphia, in the Journal of which that naturalist has described it under the name of *Fusus fluvialis*. Satisfied that no genus should contain pelagian and fluviatile shells in common, I have separated this from the family Canalifera, and placed it in that of the Melaniana to which it naturally belongs. We are indebted to the research of Professor Vanuxem for this and many other fine shells from the north fork of the Holston in Virginia on the farm of General Preston, where it was associated with several species of this and other families. Professor Vanuxem describes the spot which it inhabits as being very circumscribed and being immediately at the confluence of a small stream and the North Fork of the Holston, the former of which is slightly impregnated with salt.

ARTICLE II.

Observations on the Naïades; and Descriptions of New Species of that, and other Families. By Isaac Lea. Read before the American Philosophical Society March 16, 1832.

PRELIMINARY REMARKS.

In presenting myself again before the Society with a new memoir in that department of conchology which has so much engaged my attention for some years, an apology would seem almost necessary. My zeal and love for the science generally will, I trust, be sufficient for my present intrusion on its time.

The family *Naïades* seems to have excited very little interest with the older writers on natural history, and not much more among modern zoologists until within the present century.

The progress of general knowledge, and the improvements in the mechanic arts, have recently been greatly accelerated, and the discoveries and improvements in the study of natural science, have gone on "pari passu" with them; and we have every reason to believe that the momentum which they have acquired will not be diminished, for, to use the words of one of the most successful writers of the present day, "there is growing up an enlightened public opinion" which no power is likely to arrest, and which must carry us far towards a perfect state of knowledge, while there is such a "diffusion of existing knowledge among the mass of mankind" as we have at present.

We can only account for the almost total neglect of the family *Naïades* by writers on natural history of the last century, in the fact that the fresh waters of Europe produce so few species that they had then scarcely attracted attention. The habits of these animals have been there so little studied and known, that some recent writers of reputation assert that they move with the beaks of the shell "downward," which is equivalent to saying they walk on their backs. The *anterior* part has been called the *posterior* part, which is as much as to say, that their locomotion is backward.

These facts display a great want of attention to the animal in its element,—where it would be observed to possess many curious and striking characteristics. The great systematist, the immortal Linneus, whose name will be found recorded in the book of the last student of natural history, knew so few members of this family that he classed them indiscriminately with two *marine genera*, *Mya* and *Mytilus.*

It was the rich and splendid productions of the rivers of the United States, and particularly those which are tributary to the Mississippi, which first roused the attention of the zoologist to their extraordinary characters; and they have within a few years become sought after by collectors as eagerly as the "most precious jewels of the ocean."

Urged by the solicitations of numerous scientific friends, I have continued my efforts to obtain such specimens as appeared to me to be new and undescribed, and they are now submitted to the consideration of the Society.

In my communications I have heretofore said little on the geographical position of our *Naïades.* It has, however, been to me an interesting branch of the subject, and engaged much of my attention. The great dividing ridge or chain of mountains, the Alleghanies, which seems so completely to separate our eastern from our western waters, almost as completely separates the species of this family inhabiting those parts lying east and west of it. It is a matter of doubt if there be more than two or three species of all the genera of this family existing in the eastern waters which have their analogues in the western waters. That shell, which we have considered the *Unio cariosus* of the Ohio, certainly has a different aspect from that of our eastern rivers, and might with great propriety be referred to the name which Mr Say gave it long since, viz. *U. crassus*.* There is another shell, however, in the Ohio, which has a stronger resemblance than this, and I believe it to be the analogue of the *Alasmodonta marginata* (Say). I have examined numerous specimens of this species frequently and attentively, but cannot distinguish any difference except in the size, the western shell being generally much larger. Of the numerous species and genera of the families *Lymneana*, *Melaniana* and *Peristomiana*, I have never seen a single species common to both waters. To the genus *Cyclas* I have given but little attention, but believe the same observations may be extended to this species.

What an interesting field do these facts spread open to the inquiring philosopher! Why should the streams which flow down the sides of the same range of mountains, east and west, differ so essentially in their productions?

Let us now examine the extremities of this great chain. To the north, where it is lost in the high lands which spread out along the southern boundaries of the small lakes in the state of New York, great difficulty naturally occurs in defining the line of separation. So far as my observation has extended, the shells of the river Mohawk and its tributaries are the same with those of the Delaware, Potomac, &c. with the exception of a single species *Symphynota compressa* (nobis), which is found near Albany, and which exists also in the Ohio. The tributaries of the lakes Erie, Michigan, &c., with few exceptions, produce the western species, and consequently the lakes do also.†

The great river Niagara, or rather strait connecting the lakes Erie and Ontario, furnishes us with the *U. triangularis* (Barnes), and other species, which are so peculiarly characteristic of our western waters. Never having visited the shores of lake Ontario, I cannot pronounce on its productions. The shells of the river St Lawrence are, I believe, impressed with the character of those of the lake. In this river there is, however, little to my knowledge interesting to the conchologist.

---

* A shell which I have always considered as a truncated variety of *U. crassus* of the Ohio, has by this naturalist been made a new species under the name of *U. abruptus*.

† Since writing the above I have received the *U. complanatus* (Soland.) from Lac Vaseux, which empties into Green Bay; and more recently the same species from lake Champlain. The *U. nasutus* (Say) has been observed in Grand river, which disembogues into lake Erie.

Lake Champlain, which empties its waters into the St Lawrence, is prolific in some of the western species. The *Symphynota alata*, the *Unio occidens* and the *Unio rectus*, with some other western species, are found there in great perfection, but none of the tuberculated or undulated species.

The southern extremity of the Alleghany ridge is supposed to reach into the upper part of the state of Alabama, where it terminates by spreading out into high lands east of the river Tennessee, and near to that part where the river makes its most eastern angle. The sources of the Alabama and Tombeckbee rivers, which discharge themselves into the Gulf of Mexico, are situated in these high lands, and the character of the shells of these rivers is completely the same with those of the western waters. In no instance have I observed a shell from these rivers, or the Mississippi, which possessed the characters of those of our eastern rivers. To draw the exact line of distinction here, in the present state of our knowledge, is impossible; but that such a line does exist there can scarcely be a doubt.

The great difficulty experienced by naturalists in procuring specimens from newly settled and distant parts of the United States is such, as to deprive us of much desirable information. This impediment will, it is hoped, be overcome in time, and the natural history of our country become universally known.

In the present state of our knowledge, we can only place this line somewhere between the Alabama and the Altamaha rivers. From the latter, I have seen but a single valve, which I owe to the kindness of Mr Nuttall. This is the *U. complanatus* (Soland.), and marks distinctly the character of the shells of this river to appertain to that of the eastern waters. From the river Appalachicola I have never been able to procure a single specimen, and it remains yet to be proved whether it produces shells of the eastern or western character. As, however, it disembogues in the Gulf of Mexico, it is more than probable that it possesses the same species as the western waters, and its neighbour the Alabama.

In regard to the shells of the soil, it will naturally be asked if they also differ so completely as those of the rivers on the two sides of the great ridge? In these the distinction does not exist, for we find almost every species which is common on the eastern, equally common on the western side. There are, however, some species which are not uncommon on the western side, but which do not exist, so far as my information extends, on this side. If it be demanded why the line of demarcation should not be as perfect for terrestrial as fluviatile shells, we might say in answer, that the barrier of a mountain could in time be overcome even by the slowly travelling snail. Surely in the lapse of time the progeny of those which accidentally began to climb the steeps, might descend into the valleys of the opposite side.

In finishing these introductory remarks, I wish to call the attention of those naturalists who are conveniently located, to make further observations on this branch of the science, which certainly has great interest.

In describing the *Valvata arenifera* in my last memoir, ante page 114, I was impressed with the idea, from the circumstance of finding a true operculum combined with a spiral tube, that the animal must have belonged to the family *Peristomiana.* I have reason, however, since, to doubt the truth of my conclusions. Professor Troost, now at Nashville, Tennessee, originally sent the specimens from that neighbourhood; and from his description of the animal, which he has recently communicated to me, I am induced to believe it to be a species of Linnean *Phrygania.*

Unio Nicklinianus. Plate I. fig. 1.

Testâ subtrigonâ, inæquilaterali, obliquâ, maxime undulatâ, usque ad natium apices; valvulis crassissimis; dentibus lateralibus crassis curvisque; cardinalibus maxime crassis; margaritâ albâ et iridescente.

Shell subtriangular, inequilateral, oblique, very much undulated, even to the point of the beak; valves very thick; cardinal teeth very thick; lateral teeth thick and curved; nacre pearly white and iridescent.

Hab. China. Canton, [illegible] type [illegible] [Nicklinianus [illegible] Mus. [illegible]]

My Cabinet.

Diam. 2, Length 5, Breadth 5·8 inches.

Shell subtriangular, oblique, very much spread out, with an elevated wing, flattened towards the beaks, the greatest diameter being near the posterior basal margin, covered with numerous undulations, except on the anterior and basal margins; undulations diverge from the beak, and are largest near the posterior margin: substance of the shell very thick in the region of the basal margin; beaks pointed but not elevated, covered with numerous beautiful literations to the very point; epidermis dark brown; cardinal teeth very large, thick and sulcate; lateral teeth thick and curved; anterior cicatrices rough and distinct; posterior cicatrices slight and confluent; dorsal cicatrices situated on the under side of the cardinal tooth; cavity of the beaks angular; nacre pearly white, very iridescent on the posterior part, where the undulations are visible from without.

Remarks.—I met with this very interesting species in the autumn of 1831 at a dealer's in New York. I was informed that it was supposed to be from China. A single valve only could be obtained, and this unfortunately not entirely perfect. The characters are, however, so distinct from any species I have seen, that I have not hesitated to give it a place among my new species. It is remarkable for its great extent from the top of the wing to the basal margin, and for its numerous undulations. In outline and diameter it resembles the *Symphynota complanata* (nobis) (*Alasmodonta complanata* of Barnes), but differs in being less transverse, higher in the wing, and more thickly covered with undulations. In the possession of many folds, it resembles the *U. multiplicatus* (nobis), but differs in outline (being much less transverse), as well as in the size of the undulations, which are much smaller. The point of its greatest diameter is much nearer the posterior basal margin than in the *multiplicatus.* The imperfect state of this specimen has prevented me from describing the ligament. Judging from its elevated wing, I am much inclined to believe that when perfect specimens are procured they will be found to be connate. If so, it will belong to a natural division removed from *Unio*, viz. *Symphynota.* I have dedicated this fine species to my friend P. H. Nicklin, Esq., of Philadelphia.

UNIO CAPILLARIS. Plate II. fig. 2.

Testâ suborbiculatâ, ventricosâ, subæquilaterali, postice subangulatâ; valvulis subcrassis; natibus prominentibus; epidermide nitide rugatâ; radiis numerosis capillaribusque; dentibus cardinalibus valde elevatis; lateralibus lamellatis et sursum subreclivis; margaritâ albâ et iridescente.

Shell suborbicular, ventricose, subequilateral, subangular posteriorly; valves rather thick; beaks elevated; epidermis finely wrinkled; rays numerous and capillary; cardinal teeth much elevated; lateral teeth lamellar, and inclined to curve upwards; nacre pearly white and iridescent.

Hab. Ohio. T. G. Lea.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Diam 1·2, Length 1·5, Breadth 1·9 inches.

Shell suborbicular, ventricose, subequilateral, subangular posteriorly; substance of the shell rather thick anteriorly; thinner posteriorly; beaks thick and elevated; ligament short and thick; epidermis dark and finely wrinkled, smoother towards the beaks; rays numerous, capillary, and spreading over nearly the whole disk; cardinal teeth elevated, crenate, deeply cleft in the left valve, and rising from a pit in the right; lateral teeth lamellar, crenate, inclined to turn upwards; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under side of the cardinal tooth; cavity of the beaks obtusely angular; nacre pearly white and iridescent.

Remarks.—I have had a single specimen of this shell for some years, and although satisfied it differed from any described species, I deferred bringing it forward until I should have an opportunity of examining more. In the fine collection of the Academy of Natural Sciences I found a second specimen, which so completely coincided in all its characters with mine, that I deemed it unnecessary to hesitate erecting it into a species. Both the specimens have that enlargement of the inferior portion of the umbonial slope mentioned in the remarks on the *U. Haysianus* herein described, which usually causes a remarkable and curious denticulation of the margin, and a poverty of the deposition of the nacre in that region. It has, perhaps, a stronger resemblance to *U. ellipsis* (nobis) than to any other species. It is however more rotund, more minutely rayed, and less oblique.

Unio subglobosus. Plate II. fig. 3.

Testâ subglobosâ, subæquilaterali, inflatâ et postice subangulatâ; valvulis crassis; natibus prominulis rotundatisque; dentibus cardinalibus latis striatisque, lateralibus subcurvis; margaritâ subrufâ, vel colore caryophylli tinctâ.

Shell subglobose, nearly equilateral, inflated, subangular behind; valves thick; beaks slightly prominent, rounded; cardinal teeth wide and striated; lateral teeth somewhat curved; nacre pearly and pink coloured.

Hab. Bayou Teche, Louisiana. W. M. Stewart.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Mr Stewart.
Cabinet of William Hyde.
Cabinet of P. H. Nicklin.

Diam. 1·6, Length 2·1, Breadth 2·9 inches.

Shell subglobose, subequilateral, subangular behind, inflated; substance of the shell thick; umbonial slope carinate; beaks slightly prominent, rounded; ligament rather short and thick; epidermis dark brown or black; cardinal teeth wide, striate, but not divided; lateral teeth somewhat curved, serrate and separated from the cardinal teeth by the absence of a plate; anterior cicatrices distinct, posterior cicatrices confluent and large; dorsal cicatrices situated across the cavity of the beaks and very distinct; cavity of the beaks large and rounded; nacre pearly and pink coloured.

Remarks.—This very distinct species is one of the many fine shells collected by Mr Stewart in the Bayou Teche. It perhaps most resembles an inflated specimen of *U. cuneatus* (Barnes). It may, however, at once be distinguished from that species by its peculiarly beautiful pinky lustre and striate cardinal teeth, as well by its globosity. The striæ of the cardinal teeth diverge from a point beneath the point of the beaks, and in its flatness and absence of a cleft these teeth resemble those of the *U. rubiginosus* (nobis).

UNIO CAPSÆFORMIS. Plate II. fig. 4.

Testâ ellipticâ, transversâ, inæquilaterali, subinflatâ, postice subtriangulatâ; valvulis antice crassioribus; natibus prominulis; dentibus utriusque valvulæ cardinalibus, elevatis duplicibusque; lateralibus elevatis et lamellatis; margaritâ albâ et iridescente.

Shell elliptical, transverse, inequilateral, somewhat inflated, sub-biangulate posteriorly; valves thicker anteriorly; beaks slightly elevated; cardinal teeth elevated and double in both valves; lateral teeth elevated and lamellar; nacre pearly white and iridescent.

Hab. Cumberland River. W. Cooper.
My Cabinet.
Cabinet of W. Cooper.
Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. .9, Length 1.3, Breadth 1.9 inches.

Shell elliptical, transverse, inequilateral, somewhat inflated, flattish before the umbonial slope, sub-biangulate posteriorly; substance of the shell thick anteriorly and thin posteriorly; beaks slightly elevated and rounded; ligament short and thick; epidermis yellow, with numerous small green rays; cardinal teeth elevated, double and crested in both valves; lateral teeth elevated and lamellar; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated within the cavity of the shell on the plate between the cardinal and lateral teeth and on the base of the cardinal tooth; cavity of the beaks wide and obtusely angulate; nacre white on the anterior and iridescent on the posterior portion.

Remarks.—While engaged in my last memoir, this shell attracted my attention. I had not, however, then, an opportunity of examining more than two or three specimens, and finding they differed much in some characters, I deferred noticing them. I owe to Mr Cooper the advantage of examining his specimens, which convinced me the species was distinct. This is one of those species which sometimes dilate or increase about the region of the umbonial slope, and in this and its rays it resembles, in a slight degree, the *U. perplexus* (nobis). The enlargement of this portion of the shell, which is generally a deep green, causes it to have a different outline, being there more rounded and causing the basal margin to be arcuate.

UNIO RAVENELIANUS. Plate III. fig. 5.

Testâ late ovatâ, obliquâ, inæquilaterali, postice subangulutâ; valvulis antice crassioribus; dentibus cardinalibus crassis brevibusque; lateralibus crassis rectisque; margaritâ albâ et iridescente.

Shell widely ovate, oblique, inequilateral, subangulate posteriorly; valves thicker anteriorly; cardinal teeth short and thick; lateral teeth straight and thick; nacre pearly white and iridescent.

Hab. French Broad River, tributary to the Tennessee, near Asheville, N. C. Professor Ravenel.

My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of Professor Ravenel, Charleston, S. C.
Cabinet of P. H. Nicklin.
Cabinet of Professor Vanuxem.

Diam. ·7, Length ·9, Breadth 1·5 inches.

Shell widely ovate, oblique, inequilateral, subangulate posteriorly, slightly inflated, compressed at posterior and inferior margins; substance of the shell thick and white anteriorly, thin and iridescent posteriorly; ligament short and thick; epidermis dark brown and finely wrinkled; cardinal tooth short, thick and deeply divided in the left valve, single and rising from a pit in the right valve; lateral teeth oblique, straight and thick, having a direction over the lateral tooth; anterior and posterior cicatrices both distinct; dorsal cicatrices situated within the cavity of the shell on the plate between the cardinal and lateral teeth; cavity of the beaks shallow and rounded; nacre white in the anterior, and iridescent in the posterior portion.

Remarks.—This shell, which I owe to the kindness of Professor Ravenel, has, I believe, been first noticed by that gentleman, who, supposing it to be new, sent it to me about a year since. It differs in its outline from any of our eastern species, as it does also in its obliquity. In these characters it most resembles the *U. patulus* (nobis); it is, however, more dilated,—in some specimens the margin being subrotund. The only specimens obtained by Professor Ravenel being imperfect, and much eroded at the beaks, I have not described that part, leaving it for future observation. There are no rays to be observed on the specimens I have. In young or fine specimens, it is very possible they may exist.

UNIO MURCHISONIANUS. Plate III. fig. 6.

Testâ angulato-ellipticâ, transversâ, inæquilaterali, valvulis tenuiculis; natibus perplicatis; dentibus cardinalibus in valvulâ utrâque duplicibus, lateralibus rectis; margaritâ pulchrâ, iridescente, et salmonis colore subtinctâ.

Shell narrow-elliptical, transverse, inequilateral; valves rather thin; beaks much plicated; cardinal teeth double in both valves; lateral teeth straight; nacre splendidly pearly, slightly salmon coloured, and beautifully iridescent.

Hab. China. Mrs Murchison.
My Cabinet.

Diam. ·7,	Length ·8,	Breadth 1·9 inches.

Shell narrow-elliptical, transverse, inequilateral, angular behind, and slightly emarginate at basal margin; substance of the shell rather thin; beaks and umbones beautifully plicated; umbonial slope subcarinate and rough with the angles of the folds; posterior slope finely plicate; ligament yellow and narrow; epidermis dark green; cardinal teeth double in both valves; lateral teeth straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks shallow; nacre rich, and splendidly pearly, slightly salmon coloured, and beautifully iridescent.

Remarks.—This splendid species I owe to the great kindness of Mrs Murchison, the wife of the present learned president of the Geological Society of London. Among many fine and rare shells received from her I found this, which appears not to have been before described. It perhaps most resembles the *U. cœruleus* (nobis), particularly in the outline: it is, however, rather more transverse. It differs greatly from the *cœruleus* in the number and size of the folds. These, behind the umbonial slope, are parallel to the ligament; while those on the anterior margin are oblique. The acute angles formed by the folds on the umbonial slope are very remarkable. The inferior part of the shell is free from folds: this may not, however, prove a constant character. Its nacre is without exception finer than any I have ever seen, and rich beyond description. The folds being visible from the interior, add greatly to its lustre.*

---

* Since writing these remarks I have seen several specimens of this shell in Europe. At the Jardin des Plantes, Monsieur de Blainville showed me two or three specimens recently received, and not yet placed in the cabinet. He considered the shell undescribed, until I mentioned the name I had given it.

UNIO HAYSIANUS. Plate III. fig. 7.

Testâ subrotundâ, subventricosâ, ad baseos marginem posteriorem dentatâ; valvulis subcrassis; natibus prominentibus; epidermide luteo-fuscâ lævissimaque; radiis obsoletis; dentibus cardinalibus in lobos divisis, lateralibus crassis rectisque; margaritâ cacao colore tinctâ.

Shell subrotund, slightly ventricose, dentate at posterior basal margin; valves scarcely thick; beaks elevated; epidermis yellowish brown and very smooth; rays obsolete; cardinal teeth lobed; lateral teeth thick and straight; nacre chocolate coloured.

Hab. Cumberland River. Professor Troost.
My Cabinet.
Cabinet of Mr Cooper.
Cabinet of Professor Troost, Nashville.

Diam. ·6, Length ·8, Breadth 1 inch.

Shell subrotund, nearly equilateral, slightly ventricose, dentate at posterior margin, depressed before the umbonial slope; substance of the shell scarcely thick; beaks thick and elevated; epidermis yellowish-brown, very smooth and shining; rays obsolete; cardinal teeth lobed, double in the left valve, single and rising from a pit in the right valve; lateral teeth short, thick and straight; posterior and anterior cicatrices both distinct; dorsal cicatrices situated within the cavity of the shell on the plate between the cardinal and lateral teeth; cavity of the beaks deep and angulated; nacre chocolate coloured and iridescent posteriorly.

Remarks.—It has been in my power to examine only four or five specimens of this exceedingly interesting shell. In each of these there is more or less of a dentate appearance, which is so unusual among the *Naïades* that it may, perhaps with propriety, be said to belong to some American species only. In the early stages of growth there is no dentate appearance. The *U. sulcatus* (nobis) and the *U. arcæformis* (nobis), are frequently furnished with this curious appendage. The dentate variety, mentioned in my description of *U. sulcatus*, has been, by Mr Say, erected into a separate species, under the name of *ridibundus;* in the propriety of which, however, I cannot agree with that naturalist. In outline the present species resembles the *U. subrotun-*

dus; it is, however, more oblique, and in the epidermis more shining. It is not so oblique as the *sulcatus*, but has a furrow anterior to the umbonial slope similar to that species. In the epidermis it differs very much, the *sulcatus* being finely wrinkled and finely rayed. In some specimens the successive rows of teeth along the posterior margin cause that portion of the shell to swell out, which gives it a rich and beautiful appearance. It is, though small, among the most interesting of our species. The specimen here represented, I owe to the kindness of Mr Cooper. It is with pleasure I dedicate this species to my friend, Isaac Hays, M.D., whose talents have been actively and successfully engaged many years in the promotion of natural as well as medical science.

UNIO HILDRETHIANUS. Plate III. fig. 8.

Testâ angusto-ellipticâ, subcylindraceâ, valde transversâ, inæquilaterali; valvulis tenuibus; dente cardinali in valvulâ utrâque unico, laterali nullo; margaritâ superne fuscâ, inferne albâ et iridescente.

Shell narrow-elliptical, subcylindrical, very transverse, inequilateral; valves thin; cardinal teeth single in each valve; without lateral teeth; nacre, above brown, below white and iridescent.

Hab. Ohio, near Marietta. Dr Hildreth.
My Cabinet.
Cabinet of Dr Hildreth.
Cabinet of the Academy of Natural Sciences.

Diam ·5, Length ·7, Breadth 1·6 inches.

Shell narrow-elliptical, subcylindrical, very transverse, inequilateral, somewhat compressed at basal margin; substance of the shell thin behind, thicker before; beaks slightly elevated; ligament long and thin; epidermis dark brown; cardinal teeth lobed, single in each valve, larger and wider in the left valve; lateral teeth none; anterior and posterior cicatrices both confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks shallow and tinged with dull purple; nacre white and iridescent.

Remarks.—Among the *Uniones* there is a group to which this species naturally belongs. This group is characterized by the imperfection of the hinge, the cardinal teeth being so immature as to present scarcely any thing but lobes. Like the *soleniformis* it lives under stones and other protected places. In the present species the tooth of the right valve shuts before that of the left, and the lateral teeth, if not entirely wanting, are obsolete. The group, as far as I know it at present, consists of the *U. oriens* (nobis), *U. soleniformis* (nobis), and the present species. In size and outline of the margin, this species resembles the *U. iris* (nobis). It has not, however, the brilliant nacre, nor the fine rays of that species, and in the conformation of the teeth it differs very much. Some individuals vary from the cylindrical form, being somewhat compressed. As a mark of respect for the talents of Dr Hildreth, and his assiduity in promoting a knowledge of the natural history of his vicinity, I dedicate this species to him.

UNIO SCHOOLCRAFTENSIS. Plate III. fig. 9.

Testâ subrotundatâ, subæquilaterali, compressâ, post clivum umboniale subtuberculatâ; valvulis subcrassis; natibus prominentibus; epidermide fulvâ, latoradiatâ; dentibus cardinalibus prominentibus, lateralibus laminatis rectisque; margaritâ albâ et iridescente.

Shell subrotund, nearly equilateral, compressed, slightly tuberculated behind the umbonial slope; valves rather thick; beaks elevated; epidermis yellow with broad rays; cardinal teeth elevated; lateral teeth straight and lamellar; nacre pearly white and iridescent.

Hab. Fox River of Green Bay. Mr Schoolcraft.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. ·7, Length 1·1, Breadth 1·3 inches.

Shell subrotund, somewhat angular at posterior dorsal margin, nearly equilateral, compressed, slightly tuberculated posterior to umbonial slope; substance of the shell rather thick; beaks elevated; ligament short; epidermis smooth, somewhat yellow, with several broad green rays—that over the centre of the disk being broadest; cardinal teeth elevated and cleft in the left valve, single and rising from a pit in the right; lateral teeth elevated, straight and lamellar; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices within the cavity of the shell on the base of the cardinal tooth; cavity of the beaks angular and deep; nacre pearly white and iridescent.

Remarks.—Among the many fine shells presented to the Academy of Natural Sciences by Mr Schoolcraft from the region of the upper lakes, there was a single specimen of the present species. It does not seem referable to any described species, and I have consequently been induced to give it a separate place in the genus. It resembles most the *U. rubiginosus* (nobis) in outline, but differs from it in being more rounded on the inferior and posterior portions of the margins, as well as in the cardinal tooth being more elevated and more deeply cleft. In the rays it differs very much from that species. In this specimen they are very remarkable, there being a very distinct broad one anterior to the umbonial slope, covering one third of the side of the disk, and two smaller, posterior to the umbonial slope. When there is but a single specimen to describe from, it should be remembered that many characters are not permanent, and I should not be surprised if specimens of this species be found without a single ray, although they are so striking in this. The tubercles, which are so indistinct, may in other specimens be more distinct and more numerous. In this case it will approach so closely to the *asperrimus* (nobis), that it may prove to be only a variety.

UNIO GEOMETRICUS. Plate IV. fig. 10.

Testâ trapezoidali, valde inequilaterali, transversâ, compressâ; valvulis tenuibus; natibus prominulis, rugis concentricis; dentibus cardinalibus in valvulâ utrâque obliquis duplicibusque, lateralibus subrectis; margaritâ purpureâ.

Shell trapezoidal, very inequilateral, transverse, compressed; valves thin; beaks slightly prominent and concentrically wrinkled; cardinal teeth oblique and double in both valves; lateral teeth nearly straight; nacre purple.

Hab. Bayou Teche, Louisiana. W. M. Stewart.

My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Mr Stewart.
Cabinet of Mr Hyde.

Diam. ·9, Length 1·4, Breadth 2·7 inches.

Shell trapezoidal, very inequilateral, transverse, compressed, angular behind; substance of the shell rather thin; umbonial slope subcarinate; beaks slightly prominent, placed near the anterior margin and concentrically wrinkled; carina much elevated; ligament long, narrow and nearly straight; epidermis dark brown, wrinkled and sometimes obscurely rayed; cardinal teeth oblique and double in both valves; lateral teeth nearly straight and lamelliform; anterior cicatrices distinct, posterior cicatrices confluent; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks shallow: nacre purple and iridescent.

Remarks.—This interesting species is one of the collection made by Mr Stewart in the Bayou Teche. It is a very distinct and beautiful species. Its form is more like a trapezium than that of any other species with which I am acquainted. It resembles most the *U. complanatus* (Soland.). It differs from it, however, in its remarkable outline, in its teeth, in the concentric wrinkles of the beaks, and in the beaks being placed nearer to the anterior margin. The angle of the posterior margin is also more acute. In the deep brown colour of the epidermis and in outline of the margin it approaches the *U. obesus* (nobis). It is, however, much less inflated.

UNIO TAITIANUS. Plate IV. fig. 11.

Testa subtriangulari, obliquâ crassâque; valvulis antice crassioribus; dentibus cardinalibus grandibus et elevatis, lateralibus crassis et subcurvis; margaritâ albâ.

Shell subtriangular, thick and oblique; valves thicker anteriorly; cardinal teeth large and elevated; lateral teeth thick and slightly curved; nacre pearly white.

Hab. Alabama River. Judge Tait.
My Cabinet.

Diam. 1·1, Length 1·5, Breadth 1·5 inches.

Shell subtriangular, thick, oblique, depressed anterior to umbonial slope; substance of the shell very thick anteriorly and thin posteriorly; beaks very thick and much elevated; epidermis dark brown and wrinkled; cardinal teeth large, crenate and deeply cleft in the left valve, and emerging from a pit in the right; lateral teeth thick, slightly curved and nearly parallel with the line of the cardinal teeth; anterior cicatrices distinct, the great one forming a deep pit; posterior cicatrices distinct, the smaller one being placed at the end of the lateral tooth; dorsal cicatrices situated on the plate between the cardinal and lateral teeth; cavity of the beaks shallow; nacre pearly white.

Remarks.—There is no species which this so closely resembles as the *scalenius* (Rafin.). It is, however, less oblique and more expanded along the posterior basal margin, and the posterior margin forms a more obtuse angle. It is with great pleasure I name it after my friend, Judge Tait of Claiborne, Alabama, to whom science is greatly indebted for his exertions in making known the natural history of his vicinity.

UNIO LACTEOLUS. Plate VIII. fig. 19.

Testâ ellipticâ, transversâ, inæquilaterali, subinflatâ; valvulis subcrassis; natibus radiatis, plicis brevibus; dentibus cardinalibus in valvulâ utrâque duplicibus longisque; lateralibus longis, a cardinalibus separatis; margaritâ lacteolâ.

Shell elliptical, transverse, inequilateral, somewhat inflated; valves not thick; beaks having short radiating folds; cardinal teeth long and double in both valves; lateral teeth long and separate from the cardinal teeth; nacre pearly and milk white.

Hab. Rio de la Plata.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of W. Hyde.
Unio delodonta? Lam.

Diam. 1·2, Length 2, Breadth 3·2 inches.

Shell elliptical, transverse, inequilateral, somewhat inflated; substance of the shell not thick; beaks rounded, having short radiating folds; ligament rather short; epidermis dark brown and wrinkled; cardinal teeth long, oblique, nearly parallel with the margin and double in both valves; lateral teeth long, slightly curved and separated from the cardinal teeth by the absence of a plate; anterior and posterior cicatrices both confluent; dorsal cicatrices situated across the cavity of the beaks; cavity of the beaks rounded and not deep; nacre very pearly, milk white, iridescent behind.

Remarks.—I am indebted to the kindness of Dr Ward of Salem, for a perfect specimen of this species. In outline it approaches the *U. marginalis* (Lam.), but is less transverse. In the characters of its teeth it closely resembles that species. It differs from it in being more inflated, more wrinkled and in having a thicker nacre. In the possession of radiated folds on the beaks it differs altogether.

On the base of the cardinal tooth, near to the great cicatrix, there is a small deeply impressed cicatrix, resembling in its characters that of the *Hyria avicularis* (Lam.), mentioned at page 77, ante.

The specimen here figured belongs to the fine cabinet of Mr Hyde.

SYMPHYNOTA GLOBOSA. Plate IV. fig. 12.

Testâ valde globosâ, inæquilaterali, pellucidâ; valvulis tenuiculis, natibus rotundissimis, incurvis; epidermide luteâ, lævissimâ; dentibus cardinalibus laminatis, lateralibus elevatis et laminatis; margaritâ albâ et iridescente.

Shell very globose, inequilateral, translucent; valves rather thin; beaks very round, incurved; epidermis very smooth and pale yellow; cardinal teeth lamellar; lateral teeth elevated and lamellar; nacre pearly white and iridescent.

Hab. River Ohio, 150 miles below Louisville. Col. Long.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Peale's Museum.

Diam 2·4, Length 2·5, Breadth 3·5 inches.

Shell very globose, inequilateral, translucent, very smooth and bright; connate before and behind the beaks; substance of the shell rather thin; beaks very round, incurved; epidermis very smooth, and pale yellow or straw colour; umbones very round; cardinal teeth very lamellar, elevated, double in the right valve, and very crenate and single in the left; the line of the lateral and cardinal teeth form two curves; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated in the cavity of the beaks on the under side of the cardinal teeth; palleal cicatrix deeply impressed; cavity of the beaks very round and very deep; nacre thicker near the margin, beautifully pearly white and iridescent.

Remarks.—We owe to Col. Long and Mr T. Peale the knowledge of this singular and distinct species. Without a tubercle and almost rayless, for those on the posterior slope are obsolete, it is among the most beautiful and interesting species known. The Academy is in possession of four fine specimens, making a complete suite of different ages. Three of them are perfect enough to display the character of this genus, *Symphynota*, notwithstanding their great globosity. It is more capacious than any of the *Naïades* I have seen, and the light yellow or straw coloured epidermis is very peculiar—in form it most resembles, perhaps, the *Unio occidens* (nobis), but it has no rays. In the younger individuals there is a transverse rib-like appearance which I have noticed in no other species of the family.

SYMPHYNOTA WOODIANA. Plate V. fig. 13.

Testâ subpentagonâ, postice angulatâ, super umbones turgidâ, inæquilaterali, transversâ; valvulis tenuibus; epidermide tenebroso-fuscâ et obscuro-radiatâ; natibus undulatis; margaritâ albâ et iridescente.

Shell subpentagonal, angular behind, turgid over the umbones, inequilateral, transverse; valves thin; epidermis dark brown and obscurely rayed; beaks undulated; nacre pearly white and iridescent.

Hab. China. W. W. Wood.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. 1·5, Length 2·2, Breadth 3·5 inches.

Shell subpentagonal, angular behind, transverse, inequilateral, irregularly swollen over the umbones, slightly compressed somewhat before and below the umbones, posterior slope carinate; substance of the shell thin; epidermis wrinkled, dark brown with obsolete rays; ligament long and somewhat thick; beaks slightly inflated and undulated; cicatrices scarcely perceptible posteriorly, more deeply impressed anteriorly; cavity of the beaks shallow; cavity of the disk impressed immediately under the umbo; nacre pearly white and iridescent.

Remarks.—This species was first, I believe, brought to this city from Canton by Mr Wood* about five years since. To him I owe the first specimen I have seen. A younger and fine specimen I owe to the kindness of an estimable friend and accomplished conchologist, Mrs Corrie, who sent it to me from England about two years since, with a label "From China." It closely resembles the preceding species in many characters. All the specimens, however, which I have seen, perhaps half a dozen, retain the distinctive characteristics—the greater transverseness—the subpentagonal form—the slight compression anterior to the umbones—the dark epidermis—the absence almost entirely of rays and its want of a rich nacre—in all these it differs from the *magnifica* herein described. It is usually larger than the specimen figured.

SYMPHYNOTA MAGNIFICA. Plate V. fig. 14.

Testâ subrotundâ, prope nates valde inflatâ, inæquilaterali, postice obtuso-angulatâ; valvulis tenuibus; epidermide luteâ, multis radiis viridibus; natibus

---

* On my return from Europe I found a box of shells sent to me by Mr Wood from Canton, in which were several specimens of a tuberculated *Unio*, which, on examination, I perceived immediately to be a new species, which the distinguished naturalist, John Edward Gray, Esq., of London, did me the honour, while in that city last June, to name *Leanus*.

inflatis, prope apices undulatis; cicatricibus vix cernendis; margaritâ pulchrâ et iridescente.

Shell subrotund, much inflated near the beaks, inequilateral, obtusely angular behind; valves thin; epidermis yellow, with numerous green rays; beaks inflated, near the tip undulated; cicatrices scarcely perceptible; nacre beautifully pearly and iridescent.

Hab. China. W. W. Wood.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Mr Hyde.

Diam. 1·6, Length 2·3, Breadth 3·4 inches.

Shell subrotund, much inflated in the region of the beaks, inequilateral, connate before and behind the beaks, obtusely angular behind, rounded before, posterior slope carinate; substance of the shell thin; epidermis smooth, yellow with numerous beautiful green rays over the whole disk, which are darker on the posterior part and obsolete on the umbones; ligament long and thin; beaks inflated and terminated with about six nearly parallel undulations; teeth, none; cicatrices scarcely perceptible; cavity of the beaks shallow and rounded; nacre beautifully pearly and highly iridescent, sometimes tinged with salmon and pink.

Remarks.—Several specimens of this species have been within a few years received from Canton, and Mr Wood, to whom I owe one of mine, informed me that he believes it to be a native of that country, and most probably dwelling in the waters of the neighbourhood of Canton. It is certainly among the most beautiful of the genus which has come under my notice, and is remarkable for its great area, its inflation of the region of the beaks, its smooth epidermis, its splendid rays and exquisitely beautiful nacre, which no pencil can imitate. I have it of several different ages—when very young it is less rotund, being somewhat trapezoidal, the dorsal margin nearly straight and the rays obsolete. The specimen figured is not half the size of the largest specimen in my cabinet, but I have chosen it for its great perfection in having the valves completely connate before and behind the beaks.

ANODONTA FERUSSACIANA. Plate VI. fig. 15.

Testâ subcylindraceâ, inæquilaterali, inflatâ; margine dorsali sub natium apices curvâ; valvulis tenuibus; epidermide fulgidâ, obsolete radiatâ, olivæ colorem tenebrosum habente; natibus prominulis, binis ternisve undulis exiguis ad apices; cicatricibus conspicuis; margaritâ cœruleo-albâ et iridescente.

Shell subcylindrical, inequilateral, inflated; dorsal margin curved immediately under the point of the beak; valves thin; epidermis dark olive, shining, with obsolete rays; beaks somewhat prominent with two or three small undulations at tip; cicatrices perceptible; nacre bluish white and iridescent.

Hab. Ohio River, near Cincinnati. T. G. Lea.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Mr Nicklin.
Cabinet of Professor Vanuxem.
Cabinet of the American Philosophical Society of Philadelphia.

Diam. 1·4, Length 1·8, Breadth 3·5 inches.

Shell subcylindrical, inequilateral, much inflated, more angular behind than before; dorsal margin curved immediately under the point of the beak; basal margin disposed to be emarginate; substance of the shell thin; epidermis dark olive, shining, with numerous obsolete rays, near the beaks lighter and destitute of rays; ligament rather short and thin; beaks somewhat prominent with two or three small undulations at tip; cicatrices perceptible; cavity of the beaks shallow; cavity of the disk deep and rounded; nacre bluish white and iridescent.

Remarks.—This species was received with the *A. incerta*, herein described, from the Ohio river. It differs from that species in having prominent beaks, in being more cylindrical, in its dark colour, and in the curve which exists immediately under the beaks, in which it resembles the *A. areolus* (Swainson). In the latter this curve is so strong and thick as to resemble an incipient tooth. In young specimens the epidermis is more on the yellow, and the rays greenish and bright.*

---

* Since the above description was made and the figure printed, I am in possession of several specimens from Illinois, beautifully and very distinctly rayed.

ANODONTA INCERTA. Plate VI. fig. 16.

Testâ lato-ellipticâ, postice subangulatâ, inflatâ, margine dorsali subrectâ; valvulis tenuissimis; epidermide subviride, obsolete radiatâ; natibus complanatis et minute undulatis; cicatricibus vix cernendis; margaritâ cœruleo-albâ et iridescente.

Shell wide-elliptical, subangular behind, inflated, nearly straight on the dorsal margin; valves very thin; epidermis greenish with obsolete rays, beaks flattened and minutely undulated; cicatrices scarcely perceptible; nacre bluish white and iridescent.

Hab. Ohio River near Cincinnati. T. G. Lea.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Professor Vanuxem.
Cabinet of P. H. Nicklin.

Diam. 1·2, Length 1·5, Breadth 3·2 inches.

Shell wide-elliptical, subangular behind, inequilateral, inflated, dorsal margin nearly straight, rounded before; substance of the shell very thin; epidermis very smooth, green and olive green with obsolete rays, three being more distinct on the posterior part of each valve; ligament long and thin; beaks flattened, minutely undulated near the tip which terminates with a minute point from which an indistinct line runs towards the posterior margin; cicatrices scarcely perceptible; cavity of the beaks scarcely perceptible; cavity of the disk deep and rounded; nacre bluish white and iridescent.

Remarks.—Among the earliest shells I procured from the Ohio, many years since, were several specimens of this fragile *Anodonta.* The difficulty of separating the species of a genus with so few tangible characters induced me to lay this aside with some other species until more leisure would permit a thorough examination. It perhaps most closely resembles the *A. cataracta* of Say, but differs from it peculiarly in the flatness of the beaks. It is generally more inflated, particularly near the umbonial slope. It resembles the *A. Ferussaciana* (nobis), the description of which see. The young differ from the old in being much compressed and in having rays only on the posterior part of the shell, where the three on each valve are distinctly visible—they are also more straight on the dorsal margin. The smoothness and polish, as well as the brightness of the green of some of the specimens are very remarkable.

ANODONTA STEWARTIANA. Plate VI. fig. 17.

Testâ rotundato-ovatâ, valde inflatâ; valvulis pertenuibus; epidermide subasperâ, tenebroso-viridi, natibus prominentibus, apicibus granulatis; cicatricibus subobsoletis aut vix perspicuis; margarita cœruleo-albâ.

Shell rotundo-ovate, much inflated; valves very thin; epidermis roughish, olive green; beaks prominent and granulate at tip; cicatrices scarcely perceptible; nacre bluish white.

Hab. River Teche, Louisiana. W. M. Stewart.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Mr Stewart.

Diam. 1·8, Length 2, Breadth 3·1 inches.

Shell rotundo-ovate, much inflated, subangular behind; dorsal line slightly curved; substance of the shell thin; epidermis somewhat rough, olive green and obsoletely rayed; beaks prominent, granulate at tip in a short double series; cicatrices scarcely perceptible; cavity of the beaks deep and incurved; cavity of the disk deep and rounded; nacre bluish white and iridescent, sometimes tinged with salmon colour about the region of the beaks.

Remarks.—I owe this species with numerous others to my friend Mr Stewart who procured and gave it to me more than two years since. I did not then describe it, although I believed it to be new, intending it to accompany some others which are now embodied in this memoir. It is an interesting species, being much inflated—the young specimens approached the globose form. It is most similar in form to the *gibbosa* (Say), but is perhaps less inflated, does not possess a polished epidermis, and has granulations at the termination of the beaks, while the *gibbosa* has undulations. The inflation of the *Stewartiana* is more spherical, the other is gibbous. The posterior slope of the young specimen is decorated with six distinct green rays, there being three on each valve.

ANODONTA PALNA. Plate VII. fig. 18.

Testâ subovatâ, inæquilaterali, subcompressa; valvulis subcrassis; epidermide olivaceâ et obsolete radiatâ; natibus prominentibus; apicibus granulatis; cicatricibus perspicuis; margaritâ albâ; sed in natium cavo interdum colore salmonis tinctâ.

Shell subovate, inequilateral, rather compressed; valves somewhat thick; epidermis olive with obsolete rays; beaks prominent and granulate at tip; cicatrices perceptible; nacre white, sometimes salmon in the cavity of the beaks.

Hab. Bear Grass Creek, near Louisville. Mr T. H. Taylor.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Mr Ronaldson.

Diam. 2·3, Length 3·1, Breadth 5·6 inches.

Shell subovate, inequilateral, rather compressed, subangular behind; dorsal line slightly curved; substance of the shell thick; epidermis smooth, olive to dark green, brighter on the beaks; rays obsolete; ligament long and thick; beaks elevated, granulate at tip; cicatrices perceptible; cavity of the beaks rather deep and rounded; cavity of the disk somewhat flattened; nacre white, sometimes salmon coloured in and about the cavity of the beaks.

Remarks.—This species of Anodonta offers quite a large area in the circumference of the disk. Some specimens are, however, more transverse than the one here described. It has a predisposition to salmon colour in the region of the cavity of the beaks, and this is sometimes of a very deep tint. The colour is irregularly distributed, sometimes quite in spots, and a roughness, apparently a disease, often accompanies it and produces a carious state of the nacre. It perhaps most closely resembles the *A. cataracta* (Say); but is usually less inflated, is thicker in the substance of the shell, and less transverse.

Helicina lens. Plate XIX. fig. 56.

Testâ parvâ, lenticulari, supra luteâ, subtus rufâ; anfractibus tribus, quorum inferiori carinato; spirâ plano-convexâ; aperturâ dilatatâ; labro crasso; columellâ subcallosâ et luteolâ.

Shell small, lenticular, yellow above and red below; whorls three, inferior one carinate; spire plano-convex; aperture dilated; outer lip thick; columella thinly coated and yellowish.

Hab. Feejee Islands. W. W. Wood.

My Cabinet.

Diam. 5-20ths, Length 4-20ths of an inch.

The smaller figure is of the size of nature.

Remarks.—The lenticular form and sharp carina of the body whorl distinguish this species. Within it is orange, and about the base of the shell there is a disposition to yellow.

Helicina pulcherrima. Plate XIX. fig. 57.

Testâ subviridi, subglobosâ, crassâ, minute striatâ; anfractibus quaternis, quorum infimo fasciâ albo-fuscâ induto; spira obtusâ; aperturâ dilatatâ; labro albo et reflexo; columellâ callosâ, albâ, fulgenti, tuberculo parvo ad basim.

Shell subglobose, greenish, thick, finely striate; whorls four, the body whorl having an indistinct white and brown band; spire obtuse; aperture dilated; outer lip white and reflected; columella white, thickly coated and shining, with a small tubercle at the bottom.

Hab. Java?

My Cabinet.

Diam. ·8, Length ·7 of an inch.

Remarks.—This is perhaps the finest species yet known of the genus. It is remarkable for its size and weight, and the strong and wide callus on the columella. Under the epidermis it varies from a dark orange to lemon yellow. A depauperated specimen in my possession would scarcely be recognized as the same species, owing to the density of the orange colour. The apex of the perfect shell, having but a thin epidermis, presents an orange appearance,—this colour may also be observed on the inside of the shell. At the base of the columella there is an obsolete tubercle. The band sometimes consists of a single white line only. It is believed these specimens formed part of the collection brought from Java by Mr Shillaber.

HELICINA VIRGINEA. Plate XIX. fig. 58.

Testâ subconicâ, apice acutâ, subtus inflatâ, crassâ, transversim multisulcatâ; anfractibus senis; spira elevatâ; aperturâ valde dilatatâ; labro effuso; columellâ subcallosâ.

Shell subconical, acutely pointed, inflated below, thick, with many transverse furrows; whorls six; spire elevated; aperture much dilated; outer lip effuse; columella thinly coated.

Hab. Java?

Helicina striata? Lam.

My Cabinet.

Diam. ·8, Length ·8 of an inch.

Remarks.—This species came in the same collection as that described last. It is nearly of the same diameter. It differs from it altogether in form and colour. It is remarkable for its acutely pointed apex, its milk-white appearance, and its numerous furrows. The outer lip may, with propriety, be said to be effuse rather than reflected.

HELIX MUSCARUM. Plate XIX. fig. 59.

Testâ globosâ, crassâ, politâ, longitudinaliter nitide striatâ, subfuscâ; maculis numerosis irregularibus minutis, et fasciis albis subnigris et fuscis indutâ; anfractibus ternis; spirâ rotundatâ; apice albâ; aperturâ subrotundâ; labro acuto, intus crassescenti; labio subrufo; columellâ lævi albâque.

Shell globose, thick, polished, longitudinally and finely striated, light brown, furnished with numerous irregular minute spots, and blackish brown and white bands; whorls three; spire rounded; apex white; aperture nearly round; right lip sharp, growing thicker within; left lip light red; columella smooth and white.

Hab. Society Islands, Pacific Ocean. Lieutenant Dornin.
My Cabinet.
Diam. ·8, Length ·7 of an inch.

Remarks.—This curiously and elegantly painted shell I owe to Lieutenant Dornin, who, when on board the sloop of war Vincennes on her voyage round the world, very kindly collected for me many rare and fine specimens. It is eminently distinguished by its compound band, its globosity, and its innumerable minute spots. The columella is somewhat thickened by a dark pink deposit.

HELIX PURPURAGULA. Plate XIX. fig. 60.

Testâ obtuso-conicâ, crassâ, inferne planulatâ, politâ, longitudinaliter minute striatâ, superne luteâ et fusco-virgatâ, inferne luteâ, in medium anfractum obscuro-fasciatâ, subsuturam maculatâ, imperforatâ; anfractibus quinis; spirâ obtuso-conicâ; aperturâ ovatâ, intus purpureâ; labro reflexo, prope basim majori; columellâ lævi, ad basim subconcavâ.

Shell obtusely conical, thick, flattened below, polished, minutely and longitudinally striate, above yellow and striped with brown, below yellow, obscurely banded on the middle of the whorl, irregularly spotted on the inferior part of the suture, imperforate; whorls five; spire obtusely conical; aperture oval, purple inside; outer lip subreflected, enlarged towards the base; columella smooth and impressed at base.

Hab. Java?

My Cabinet.

Diam. ·9, Length ·6 of an inch.

Remarks.—The solidity, smoothness and purple colour of this species, which is supposed to have been of Mr Shillaber's collection, will serve to distinguish it. Like the *mamilla*, herein described, it has a thick lip and is impressed at the base of the columella. The two specimens which I have differ much in the arrangement of colour. In one the inferior portion is almost white, and a dark interrupted band encircles the middle of the whorl.

HELIX OVUM REGULI. Plate XIX. fig. 61.

Testâ super et subtus planulatâ, colore columbino tinctâ, minutis irregularibus maculis numerosis, imperforatâ; anfractibus quaternis; spirâ valde depressâ; aperturâ subovatâ, intus purpurascenti; labro acuto, subreflexo; columellâ lævi, ad basin subconcavâ.

Shell flattened above and below, dove coloured, with numerous irregular minute dots, imperforate; whorls four; spire much flattened; aperture suboval, purplish inside; outer lip somewhat reflected but sharp; columella smooth, at base impressed.

Hab. Java?

My Cabinet.

Diam. ·8, Length ·4 of an inch.

Remarks.—The very peculiar colour and the minute dots of this beautiful and interesting species eminently distinguish it from all other species which have come under my notice. The line of the superior part of the lip is almost parallel with the corresponding inferior part, and the outer posterior is consequently more round. In my specimens there are two very indistinct bands, rather lighter than the ground. In colour it greatly resembles a spotted small egg of a bird. It is supposed to have come from Mr Shillaber's collection.

HELIX MONODONTA. Plate XIX. fig. 62.

Testâ superne subconicâ, inferne inflatâ, lævi, albâ, fasciis duabus fuscis, imperforatâ; anfractibus ternis; spirâ obtusâ; aperturâ subrotundâ; labro acuto, subreflexo, subtus unico dente induto; columellâ lævi.

Shell subconical above, inflated below, smooth, white, with two brown bands, imperforate; whorls three; spire obtuse; aperture nearly round; outer lip somewhat reflected but sharp, having a single tooth on the lower limb; columella smooth.

Hab. Java?

My Cabinet.

Diam. 9-20ths, Length 7-20ths of an inch.

Remarks.—The two brown bands and single tooth of this species, together with the absence of an umbilicus, may serve to distinguish it. The superior termination of the lip is bent down towards the base of the columella. It is supposed to be from the collection of Mr Shillaber.

HELIX CYCLOSTOMOPSIS. Plate XIX. fig. 63.

Testâ subglobosâ, superne depressâ, inferne inflatâ, longitudinaliter et minute striatâ, pellucidâ, corneâ, late umbilicatâ; anfractibus quaternis; spirâ depressâ; aperturâ subcirculari; labro crasso et reflexo; columellâ lævi, ad basin crassescenti.

Shell subglobose, depressed above, inflated below, longitudinally and minutely striate, translucent, horn coloured, widely umbilicate; whorls four; spire depressed; aperture nearly a circle; outer lip thick and reflected; columella smooth, at the base thickened.

Hab. . . . .

My Cabinet.

Diam ·9, Length ·6 of an inch.

Remarks.—In its aperture this species has a strong resemblance to a *Cyclostoma.* The superior and inferior portions of the lip do not, however, join by one-fifth of a circle—the resemblance is strong in the thickness and reflection of the lip. The last whorl is very round—the umbilicus large and partly covered.

HELIX MAMILLA. Plate XIX. fig. 64.

Testâ solidâ, elevatâ, obtuso-conicâ, inferne rotundatâ, imperforatâ, colore columbino tinctâ, longitudinaliter nitide striatâ, fasciis duabus obsoletis indutâ, apice subrufo; anfractibus quinis, rotundatis; spirâ exsertâ; aperturâ subrufâ, ovatâ; labro subreflexo, crasso, prope basin majori; columellâ lævi, ad basin subconcavâ.

Shell solid, elevated, obtusely conical, rounded below, imperforate, dove coloured, transversely and finely striate, with two obsolete bands, pink at the apex; whorls five and rounded; spire elevated; aperture pink, oval; outer lip somewhat reflected, thick, enlarged towards the base; columella smooth, at the base impressed.

Hab. . . . .

My Cabinet.

Diam. ·8, Length ·7 of an inch.

Remarks.—I have rarely met with a more beautiful and interesting species of the genus than the above. It is eminently distinguished by its solidity, its thick, smooth and beautifully coloured lip, its fine delicate colour, and its elevated and red tipped spire. The columella is somewhat thickened and deeply impressed at the base.

It is to be regretted that the habitat of this species is not known. It was met with accidentally at a dealer's.

HELIX DIAPHANA. Plate XIX. fig. 65.

Testâ latâ, superne depressâ, inferne inflatâ, longitudinaliter et nitide striatâ; subluteâ, obscure bifasciatâ super medium anfractum, umbilicatâ; anfractibus quaternis; spirâ planulatâ; aperturâ magnâ et subrotundâ; labro simplici; columellâ brevissimâ lævique.

Shell wide, depressed above, inflated below, longitudinally and finely striate, pale yellow, obscurely banded above the centre of the whorl, umbilicated; whorls four;

spire flattened; aperture large and nearly round; outer lip simple; columella very short and smooth.

Hab. . . . .

My Cabinet.

Diam. 1·4, Length ·7 of an inch.

Remarks.—This species has a strong resemblance to *H. citrina.* It may be distinguished from that species by its colour, which is more pale, being almost a light horn colour; by its being more flattened, and by its band, which is white bordered on each side by a delicate brown line. The umbilicus is small.

HELIX HIMALANA. Plate XIX. fig. 66.

Testâ sinistrosâ, subcarinatâ, tenui, subdiaphanâ, umbilicatâ, superne subconvexâ, inferne inflatâ, longitudinaliter et transversim minute striatâ, superne fuscoluteâ, inferne fuscâ, prope carinam tenebrosiori; anfractibus quaternis; spirâ obtusâ; aperturâ late rotundatâ; labro simplici et acuto; *columellâ brevi.*

Shell sinistral, subcarinate, thin, translucent, umbilicated, obtusely convex above, inflated below, longitudinally, transversely and minutely striate, superior part brownish yellow, inferior part brown, being more intense near the carina; whorls four; spire obtuse; aperture widely rounded; outer lip simple and sharp; columella short.

Hab. Himalaya Mountains. Dr Burrough.

My Cabinet.
Cabinet of Dr Burrough.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Mr Hyde.

Diam. 1·1, Length ·7 of an inch.

Remarks.—In the splendid collection of objects of natural history brought from India and other countries by Dr Burrough was this species, which Dr B. procured himself among the Himalaya mountains. It is easily distinguished from any species I am acquainted with, and approaches most closely to the *H. lævipes* (Fer.). Its sinistral opening, its translucency, and its colours are very characteristic. On the inferior part of the carina, which is obtuse, the brown colour is more intense—on the superior part the yellow is brightest.

Helix vesica. Plate XIX. fig. 67.

Testâ tenui, pellucidâ, superne elevatâ et fusco-luteâ, inferne inflatâ albâque, transversim minute striatâ, umbilicatâ, anfractibus quinis; spirâ obtuso-conicâ; aperturâ subrotundâ; labro tenui et reflexo, inferne crassescenti; columellâ lævi.

Shell thin, transparent, elevated and brownish yellow above, inflated and white below, longitudinally and minutely striate, umbilicated; whorls five; spire obtusely conical; aperture nearly round; outer lip thin and reflected, on the lower part slightly thickened; columella smooth.

Hab. . . . .

My Cabinet.

Diam. ·7, Length ·5 of an inch.

Remarks.—This species is peculiarly transparent, and very strongly resembles the cuticle of a blister or the bladder of a fish. This character, and its pale brownish-yellow superior portion, and white inferior portion, together with its longitudinal striæ, eminently distinguish it. The lower part of the reflected lip is so much thickened as almost to form a tooth.

Helix cincta. Plate XIX. fig. 68.

Testâ superne depressâ, inferne inflatâ, longitudinaliter striatâ, umbilicatâ, rufo-fuscâ, fasciam fuscam aut nigram super medios anfractus habente; anfractibus quaternis; spirâ planulatâ, aperturâ subrotundatâ; labro simplici; columellâ lævi.

Shell depressed above, inflated below, longitudinally striate, umbilicated, reddish brown, with a dark brown or black band above the middle of the whorls; whorls four; spire flattened; aperture nearly round; outer lip simple; columella smooth.

Hab. Java?

My Cabinet.

Diam. ·9, Length ·6 of an inch.

Remarks.—The fine reddish-brown ground and intensely dark band distinguish this fine *Helix*. In my specimen, which is the only one I have seen, the inferior margin of the band has, adjoining it, an obscure band, of a tint somewhat lighter than the ground. It should be observed, that when other specimens may be examined, the bands may not prove so regular as in the present specimen. Around the umbilicus the colour is more pale.

HELIX WOODIANA. Plate XIX. fig. 69.

Testâ supra obtuso-conicâ, inferne inflatâ, longitudinaliter et nitide striatâ, albidâ, pellucidâ, fasciâ unicâ in medium anfractum, late umbilicatâ; anfractibus quaternis; spira obtusâ, aperturâ rotundatâ latâque; labro reflexo; columellâ lævi.

Shell obtusely conical above, inflated below, longitudinally and finely striate, pale and translucent, with a single band on the centre of the whorl, widely umbilicate; whorls four; spire obtuse; aperture wide and round; outer lip reflected; columella smooth.

Hab. China near Canton. W. W. Wood.
My Cabinet.
Cabinet of Mr Hyde.
Cabinet of P. H. Nicklin.

Diam. ·6, Length ·4 of an inch.

Remarks.—Among a number of fine shells taken by Mr Wood, who devoted himself much to natural history during some years' residence in China, was this species and the *globula* herein described, both from the neighbourhood of Canton. It may be distinguished by its brown band, its round aperture and enlarged umbilicus.

Helix globula. Plate XIX. fig. 70.

Testâ globosâ, tenebroso-corneâ, pellucidâ, umbilicatâ, longitudinaliter striatâ; anfractibus quinis; spirâ obtuso-elevatâ; aperturâ latâ et subrotundâ; labro simplici; columellâ lævi.

Shell globose, dark horn colour, translucent, umbilicated, longitudinally striate; whorls five; spire obtusely elevated; aperture wide and round; outer lip simple; columella smooth.

Hab. China, near Canton. W. W. Wood.
My Cabinet.
Cabinet of Mr Hyde.
Diam. ·6, Length ·5 of an inch.

Remarks.—I owe to the kindness of Mr Wood the specimen which is here figured. It is remarkable for its globular form and its dark horn-coloured epidermis. It has somewhat the aspect of a *Paludina.*

Paludina bi-monilifera. Plate XIX. fig. 71.

Testâ abbreviato-turritâ, tenebroso-corneâ, apice obtusâ; anfractibus seriebus duabus nodulorum circumdatis; nodulis seriei inferioris anfractuum superiorum suturâ celatis; nodulis seriei superioris majoribus, et super omnes anfractus conspicuis; suturis profundis et irregularibus; labro sub-biangulato; basi subangulatâ.

Shell obtusely turrited, dark horn colour; apex obtuse; whorls furnished with two rows of nodules; the nodules of the lower row of the upper whorls hidden by the suture, those of the upper row larger, and visible on all the whorls; sutures deep and irregular; outer lip sub-biangular; base subangular.

Hab. Alabama River. Judge Tait.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of the American Philosophical Society.
Cabinet of the Academy of Natural Sciences of Philadelphia.

Cabinet of P. H. Nicklin.
Cabinet of Baron Ferussac.
Diam. 1·1, Length 1·8 inches.

Remarks.—This superb *Paludina*, which far surpasses in point of beauty any of our species yet known, I owe to the kindness of Judge Tait. Its beautiful double tuberculated cincture at once distinguishes it from all described species. Some specimens are furnished with dark purple bands which beautifully decorate the interior of the shell, and give a dark rich green colour to its fine epidermis. In the others these are wanting, and the epidermis then has a clear and more yellow appearance. The sutures being formed immediately over the lower row of tubercles, they cause its line to be very irregular; and this row itself is hidden on the upper whorls.

SUPPLEMENT.

Read before the American Philosophical Society, March 15th, 1833.

SINCE I had the pleasure to present to this Society, nearly a year since, a Memoir on the *Naïades* and some other families, I have had it in my power to procure several interesting species, hitherto unnoticed by naturalists. In the large collection of rare shells which I procured in Europe while there last year, some of these were discovered; and most of them are, perhaps, the only specimens known, being now first described. The observations on, and corrections of, Lamarck's *Naïades*, it is hoped, will prove useful to the American conchologist.

UNIO PARALLELOPIPEDON. Plate VIII. fig. 20.

Testâ oblongâ, subcylindraceâ, transversâ, valde inæquilaterali, postice angulatâ, inflatâ, marginibus dorsi et baseos parallelis; valvulis subcrassis; natibus prominulis, retusis; epidermide fere nigrâ; dentibus cardinalibus obliquis, cristatis; lateralibus longis rectisque; margaritâ albâ et iridescente.

Shell oblong, subcylindrical, dorsal and basal margins parallel, transverse, very inequilateral, angular behind, inflated; valves rather thick; beaks somewhat elevated, retuse; epidermis almost black; cardinal teeth oblique, crested; lateral teeth long and straight; nacre pearly white and iridescent.

Hab. River Parana, Province of Corrientes.
My Cabinet.
Cabinet of Dr Burrough.
Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. ·9, Length 1·2, Breadth 2·7 inches.

Shell oblong, subcylindrical, dorsal and basal margins parallel, transverse, very inequilateral, flattish on the sides, angular behind, inflated; substance of the shell rather thick; beaks rather elevated and placed near the anterior margin; ligament long and thin; umbones flattened; umbonial slope carinate; posterior slope elevated into a carina; epidermis finely wrinkled and almost black; cardinal teeth oblique and crested, larger in the right valve; lateral teeth long and straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the beaks shallow; nacre pearly white and iridescent.

Remarks.—This species is from the Burrough collection, and is distinct from any I have seen. It resembles somewhat, in the outline of the margin, the *nasutus* of Say. The posterior slope does not, however, decline so much, the dorsal and basal margins being nearly parallel. In being subcylindrical it resembles the *cylindricus* of Say; it has not, however, either tubercles or arrow-headed markings. The very dark colour of its epidermis is peculiar.*

---

* Since the above description and the figure were made, I have seen a more perfect specimen in the possession of Dr Burrough, which has the beaks but little eroded. In

Unio Cooperianus. Plate VIII. fig. 21.

Testâ suborbiculatâ, nonnihil obliquâ, inequilaterâ, dimidio postico tuberculatâ; valvulis crassis; natibus prominentibus; dentibus cardinalibus subgrandibus; lateralibus subbrevibus, crassis rectisque; margaritâ albâ et carnis colore tinctâ.

Shell suborbicular, somewhat oblique, inequilateral, tuberculated on posterior half; valves thick; beaks elevated; cardinal teeth rather large; lateral teeth rather short, thick and straight; nacre flesh coloured and white.

Hab. River Ohio. T. G. Lea.
My Cabinet.
Cabinet of Mr Cooper.

Diam. 1·9, Length 2·8, Breadth 3·2 inches.

Shell suborbicular, somewhat oblique, inequilateral, irregularly tuberculated on the posterior half; substance of the shell thick; beaks thick and elevated; ligament rather short and thick; epidermis wrinkled, dark rusty brown; rays scarcely visible; cardinal tooth rather large and widely cleft in the left valve, single and emerging from a pit in the right valve; lateral teeth rather short, thick and straight; anterior and posterior cicatrices both distinct; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks deep and angulated; nacre flesh coloured and white, the white usually forming a broad border between the palleal cicatrix and the margin.

Remarks.—This species very closely resembles, in most of its characters, both the *verrucosus* (Barnes) and *pustulosus* (nobis). It differs from the first in never being chocolate coloured. It is rarely, I believe, entirely white like the latter. The epidermis is dark, and when rays can be seen on it, they will be found to be pencilled, and not one broad

this I found a character not perceptible in the eroded one from which the description was made, the beaks being furnished with radiated folds nearly similar to those of the *lacteolus* and *Burroughianus* described herein. This character seems to prevail very much in the South American *Uniones*. Among the numerous species described from North America, none yet have been observed to possess this character.

interrupted one like the *pustulosus.* There is a great peculiarity in the flesh or pink colour of the nacre, which is disposed to be clouded, and to be of a stronger hue about the teeth, while the cavity of the beak is nearly white.

I dedicate this species to my friend, William Cooper, Esq., as a slight acknowledgement of the many favours received in the way of communications, and the loan of specimens.

UNIO EMARGINATUS. Plate IX. fig. 22.

Testâ sub-ellipticâ, ad basim emarginatâ et compressâ, transversissimâ, valde inæquilaterâ, postice sub-triangulatâ; valvulis subcrassis; natibus prominulis, apicibus undulatis; epidermide viridi-luteâ; dentibus cardinalibus parvis, obliquis, et in valvulâ utrâque duplicibus; lateralibus longis subcurvisque; margaritâ albâ et iridescente.

Shell sub-elliptical, emarginate and compressed at base, very transverse, very inequilateral, sub-biangular behind; valves somewhat thick; beaks rather elevated and undulated at tip; epidermis greenish yellow; cardinal teeth small, oblique and double in both valves; lateral teeth long and slightly curved; nacre pearly white and iridescent.

Hab. . . . .

My Cabinet.

Diam. 1, Length 1·3, Breadth 2·8 inches.

Shell subelliptical, emarginate and compressed at base, very transverse, very inequilateral, sub-biangular behind, elevated along the umbonial slope, flattened on the umbones; substance of the shell somewhat thick; beaks rather elevated, retuse and undulate at the tip; ligament long and thin; epidermis finely wrinkled, greenish yellow, along the posterior slope green; cardinal teeth small, oblique and double in both valves; lateral teeth long and slightly curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the under part of the cardinal tooth; cavity of the beaks subangular and wide; nacre pearly white and iridescent.

Remarks.—I procured two opposed valves of different individuals of this species, which nearly match, of Mr Stutchbury, a well known and extensive dealer in London. He could not give me the least idea of its native country. From its general appearance I should presume it to come from a southern latitude, perhaps from New Holland. It is rather peculiar in its outline, being more emarginate at base than any species with which I am acquainted. The emargination is not, however, so great as in the *Mya margaritifera* (Lin.), *Alasmodonta arcuata* (Barnes). It approaches most closely the *Unio subtentus* (Say), but differs from it in the total absence of folds or "ribs" on the posterior slope. In the two valves which I possess there appear to be no rays, unless the green of the posterior slope be denominated a single broad one. The emargination and compression of the base cause the posterior part of the cavity of the shell to be effuse.

UNIO CONRADICUS. Plate IX. fig. 23.

Testâ ellipticâ, transversâ, inæquilaterâ, parte posteriori plicatâ; valvulis tenuibus; natibus ad apices nitide undulatis; dentibus cardinalibus parvis et erectis; lateralibus indistinctis; margaritâ antice albâ, postice iridescente et in cavo fusco purpureâ.

Shell elliptical, transverse, inequilateral, folded on the posterior parts; valves thin; beaks finely undulated at tip; cardinal teeth small and erect; lateral teeth not perfectly defined; nacre white anteriorly, iridescent posteriorly, and brownish purple in the cavity.

Hab. . . . . Professor Troost.

My Cabinet.

Cabinet of Professor Troost.

Diam ·6, Length ·8, Breadth 1·8 inches.

Shell elliptical, transverse, inequilateral, indistinctly folded on the posterior parts; substance of the shell thin behind, thicker before; beaks slightly elevated and finely undulated at tip; ligament rather long and thin; epidermis finely wrinkled, yellowish brown, with numerous indistinct greenish rays, which on the posterior part are disposed to be clouded; cardinal teeth small, erect, disposed to be lobed; lateral teeth long, slightly curved, not perfectly defined, having but a small cleft in the left valve; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks shallow and tinged with brownish purple; nacre white anteriorly, thinner and very iridescent posteriorly.

Remarks.—I owe to the kindness of professor Troost this little species, and name it after an indefatigable naturalist, Mr T. A. Conrad. It belongs to that group which is distinguished by an immature hinge, and which I have noticed in my remarks on the *U. Hildrethius.* The *U. Conradius* certainly resembles that shell closely. It is, however, less cylindrical, and has the teeth more perfect. It also has rays and undulations which I have not observed on the other. In outline it more closely resembles the *U. iris* (nobis), but differs in the teeth and in the rays. Having but two specimens of this species to examine, some of the characters may be found to differ in other specimens. One of these is slightly emarginate at the basal margin.

UNIO DIVARICATUS. Plate IX. fig. 24.

Testâ ellipticâ, transversâ, subcompressâ, valde inæquilaterâ; valvulis tenuibus; natibus plicis pulchris divaricatis; dentibus cardinalibus parvis, compressis; lateralibus longis et subtenuibus; margaritâ albâ et iridescente.

Shell elliptical, transverse, rather compressed, very inequilateral; valves thin; beaks with beautiful divaricating folds; cardinal teeth small, compressed; lateral teeth long and rather thin; nacre white and iridescent.

Hab. Egypt. Duke de Rivoli.
My Cabinet.

Diam. ·5, Length ·9, Breadth 1·4 inches.

Shell elliptical, transverse, somewhat compressed, very inequilateral; substance of the shell thin; beaks covered with beautiful folds diverging from their apex; ligament rather short and slender; epidermis greenish, smooth; cardinal teeth small, compressed, double in the right valve, and single in the left; lateral teeth long, rather thin and nearly straight; anterior cicatrices slightly confluent; posterior cicatrices confluent; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks shallow and subangular; nacre white and iridescent.

Remarks.—This beautiful little species I procured from the cabinet of the Duke de Rivoli in Paris. It appears to me to be inedited, and may perhaps have been considered a transverse variety of the *corrugatus* (Lam.). It ought not to be confounded with that species, being much more transverse, and the folds of the beaks differing. Lamarck, in his description of the *corrugatus*, says, "rugis angulato-flexuosis." The folds of the *divaricatus* are well marked, without angles, and diverge from the point of the beaks.

UNIO CORRIANUS. Plate IX. fig. 25.

Testâ angusto-ellipticâ, transversissimâ, valde inæquilaterâ, postice subangulatâ; valvulis tenuissimis; natibus vix prominulis; dentibus cardinalibus tenuibus et laminatis; lateralibus longis, tenuibus, subrectisque; margaritâ albâ et iridescente.

Shell narrow-elliptical, very transverse, very inequilateral, subangular behind; valves very thin; beaks scarcely prominent; cardinal teeth thin and bladed; lateral teeth long, thin and nearly straight; nacre pearly white and iridescent.

Hab. India. Mrs Corrie.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Diam. ·6, Length 1, Breadth 2·1 inches.

Shell narrow elliptical, very transverse, very inequilateral, subangular behind; dorsal line nearly straight; substance of the shell very thin; beaks very slightly elevated and minutely waved at the tip; ligament long and slender; epidermis smooth, dark brown; rays none; cardinal teeth thin, bladed, single in the *left* valve and double in the *right*; lateral teeth long, thin, bladed and nearly straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated nearly in the centre of the cavity of the beaks; cavity of the beaks exceedingly shallow; nacre pearly white and iridescent.

Remarks.—I am indebted to an amiable and intelligent friend, Mrs Corrie of Birmingham, England, for this new species, which comes from Calcutta; and to her I dedicate it, as a mark of sincere friendship. It closely resembles the *U. marginalis* of Lamarck, but differs from that species in being more transverse, in the beaks being more retuse, in the dorsal line being nearly straight, and in its not being possessed of a light border along the margin. The cardinal teeth are remarkably thin, and form nearly a line with the lateral teeth.

UNIO GRAYANUS. Plate IX. fig. 26.

Testâ lanceolatâ, transversissimâ, antice rotundatâ et postice acutissime angulatâ, prope nates et partem posticam plicatâ; lateribus planulatis; clivo umboniali subcarinato; valvulis tenuibus; natibus prope marginem anticam locatis, depressis; epidermide luteolâ, obsolete radiatâ; dentibus cardinalibus in valvulâ utrâque duplicibus et erectis; lateralibus longissimis, tenuibus, sub-erectisque; margaritâ pulchrâ et iridescente.

Shell lanceolate, very transverse, rounded before and very acutely angular behind, plicate about the beaks and posterior part of the shell, flattened on the sides; umbonial slope ridged; valves thin; beaks depressed, placed near the anterior margin; epidermis yellowish with obsolete rays; cardinal teeth double in both valves and erect; lateral teeth very long, thin and nearly straight; nacre beautifully pearly and iridescent.

Hab. China.

My Cabinet.
Cabinet of Mr Hyde.
Cabinet of Mr Gray, London.

Diam. ·6, Length ·8, Breadth 3·3 inches.

Shell lanceolate, very transverse, very inequilateral, rounded before and very acutely angular behind, irregularly folded in the region of the beaks, several larger folds on the anterior slope, on the posterior portion the folds are parallel being nearly perpendicular to the basal margin, flattened on the sides; umbonial slope elevated into a ridge, green; substance of the shell thin; beaks depressed, placed very near to the anterior margin; ligament thin, not very long; epidermis finely wrinkled, yellowish with obsolete rays, disposed to be greenish on the posterior part; cardinal teeth double in both valves, compressed and erect; lateral teeth very long, thin and nearly straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated in the cavity of the beaks; cavity of the beaks very small; nacre beautifully pearly and iridescent.

Remarks.—This is perhaps the most extraordinary *Unio* that has yet fallen to the lot of a naturalist to describe. When we cast our eyes over all the species, and then rest them on this, we shall be ready to exclaim, that nothing hereafter belonging to this genus can astonish us. Its latitude is so great, that one at first sight can scarcely believe it to belong to the family *Naïades.* Its great transverseness causes the lateral teeth to be exceedingly long, and that character, together with the acutely angular posterior margin, gives the shell the form of a crane's beak. In outline it does not approach any species I know, and therefore there can be no comparison made. I procured it of a dealer in London, and dedicate it to my friend, John Edward Gray, Esq. of the British Museum, one of the most distinguished naturalists in Great Britain, and to whose great kindness and attention while in London I am much indebted. I know of no zoologist who has, in that country, pursued our favourite science with more ardour or more success, and it is only due to him, while it gives me great pleasure to render him this tribute of respect in placing his name to one of the most interesting species of the whole family.

UNIO BURROUGHIANUS. Plate X. fig. 27.

Testâ subrotundâ, inæquilaterali, compressâ, postice subangulatâ; natibus oblique plicatis, prominulis; valvulis subcrassis; epidermide tenebroso-fuscâ; dentibus cardinalibus magnis, elevatis et laminatis, lateralibus subrectis; margaritâ albâ et iridescente.

Shell subrotund, inequilateral, compressed, subangular behind, with oblique folds on the beaks; valves rather thick; beaks somewhat elevated and much plicate; epidermis dark brown; cardinal teeth large, elevated and lamelliform; lateral teeth nearly straight; nacre pearly white and iridescent.

Hab. River Parana, Province of Corrientes. Dr Burrough.
My Cabinet.
Cabinet of Dr Burrough.
Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. ·1, Length 1·8, Breadth 2·4 inches.

Shell subrotund, inequilateral, compressed, subangular behind, with large oblique folds on the beaks; substance of the shell rather thick; beaks somewhat elevated and distinctly plicate as far as the umbones; ligament short and thin; epidermis smooth, dark brown with transverse yellow marks of growth; cardinal teeth large, elevated, lamelliform and double in both valves; lateral teeth lamelliform and nearly straight; anterior cicatrices and posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks subangular and shallow; nacre pearly white and iridescent.

Remarks.—This is of the collection of Dr Burrough, sent by him to the Academy of Natural Sciences of Philadelphia. To this gentleman natural science is much indebted for his unwearied industry in contributing to the knowledge of the Fauna—of the numerous countries through which he has travelled, in Asia, as well as on this continent. This species resembles most, perhaps, the *lacteolus* (nobis), but differs from it in being more round in the outline, in having longer and larger folds on the beaks, and in being more compressed. In the beaks it has some resemblance to the *corrugatus* (Lam.), as well also as in the outline; but the folds being nearly parallel to each other, it differs from the *corrugatus* in these, which are usually zig zag in the latter shell. I owe to the kindness of Dr Burrough the specimen in my cabinet, and I have great pleasure in dedicating the species to him.

UNIO SOWERBIANUS. Plate X. fig. 28.

Testâ subtriangulari, inflatâ, parte posticâ peculiariter compressâ et striatâ; valvulis crassissimis; natibus valde prominentibus, dentibus cardinalibus magnis; lateralibus crassis subrectisque; margaritâ in cavo albido-purpureâ.

Shell subtriangular, inflated, singularly compressed on the posterior part, which is striate; valves remarkably thick; beaks very prominent; cardinal teeth large; lateral teeth thick and nearly straight; nacre in the cavity very light purple.

Hab. Tennessee. G. B. Sowerby.
My Cabinet.
Cabinet of Mr Sowerby.

Diam. 1·5, Length 1·7, Breadth 1·8 inches.

Shell subtriangular, inflated, singularly compressed on the posterior part, which is filled with striæ passing from the beak to the posterior and posterior-basal margins, the anterior part being inflated and smooth; slightly emarginate at posterior basal margin; substance of the shell very remarkably thick, less so on the posterior part; beaks large and very prominent; ligament short and thick; epidermis bright brown, smooth and shining before, striate behind; cardinal teeth large, sulcate, elevated and cleft in the left valve, and emerging from a pit in the right valve; lateral teeth thick, short and nearly straight; anterior and posterior cicatrices both distinct; dorsal cicatrices situated on the under part of the cardinal teeth; cavity of the beaks shallow and subangular; nacre very light purple in the cavity, and white on the anterior margin.

Remarks.—To the kindness of G. B. Sowerby, Esq., one of the most distinguished writers on conchology in England, I owe the possession of this truly interesting shell, and to him I with great pleasure dedicate it. He received it from the state of Tennessee, but from what river I do not know. In general outline it resembles somewhat the *trigonus* (nobis), but differs from it in being more rotund, in having the posterior part compressed and striate, and in being coloured inside. It has a stronger resemblance to the *Haysianus* (nobis) than to any other species known to me, but differs from it in being more compressed behind, in being more striate, in being much larger (to judge from the few specimens I have seen of both), and in the difference of the colour of the nacre, the *Haysianus* being dark chocolate, while the *Sowerbianus* is of a very light purple, approaching to flesh colour.

UNIO DROMAS. Plate X. fig. 29.

Testâ subtriangulari, subobliquâ, gibbâ, irregulariter transversimque plicatâ, punctiunculis passim radiatâ; valvulis crassissimis; natibus prominentibus; dentibus cardinalibus latis, lateralibus crassis brevibusque; margaritâ albâ.

Shell subtriangular, somewhat oblique, hunch-backed, irregularly and transversely folded, with dotted rays over the whole disk; valves very thick; beaks elevated; cardinal teeth wide; lateral teeth short and thick; nacre pearly white.

Hab. Harpeth River, Tennessee. Professor Conrad.
Hab. Cumberland River, near Nashville. Professor Troost.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Professor Troost.
Cabinet of P. H. Nicklin.

Diam 1·6, Length 1·8, Breadth 1·9 inches.

Shell subtriangular, somewhat oblique, hunch-backed, irregularly and transversely folded at the separate stages of growth, furnished with an oblique furrow before the umbonial slope, substance of the shell very thick; beaks thick and elevated; ligament short, thick and dark coloured; umbones furnished with a hump; epidermis yellow, with numerous dark green dotted rays, on the anterior part furnished with about six somewhat broad rays; cardinal tooth wide and sulcate; lateral tooth short and thick, having a flat plate between it and the cardinal tooth; anterior and posterior cicatrices both distinct; dorsal cicatrices situated on the under side of the cardinal tooth; cavity of the beaks deep and angulated; nacre pearly white, on the posterior part sometimes golden.

Remarks.—I have had for some years in my cabinet two specimens of this beautiful and curious species, the first of which, a young one, I owe to the kindness of the late professor Conrad. Having recently received a complete suite from professor Troost, I have perfectly satisfied myself of (what I before doubted) its being distinct from the *irroratus* (nobis). The manner in which the hump is formed is very remarkable. As far as the third or fourth stage of growth the disks are almost flat. The deposit of the nacre after this forms an angle of nearly 45° with the surface which it has left, thus forming a hump, or obtuse angle point, directly on the umbo. This causes the curious result, that when the shell is from one third to three fourths grown, it will rest, when so placed, on the portion of surface between the point of the beak and the umbo, the basal margin remaining in the air. In its general characters it resembles the *irroratus*, but may at once be distinguished by the hump. It is devoid of tubercles, while the *irroratus* is sometimes covered with them, particularly on the posterior part. It differs somewhat also in the rays, the spots in those of the *dromas* being larger, and generally better defined. The outline differs in being less elongated, being disposed to be more oblique or more transverse. In regard to the structure of the animal, I am not prepared to say that it differs from that of the *irroratus*.* Not having had an opportunity to examine the animal, I can only judge by analogy, which would, I think, induce one to conclude that the same curious pendent oviducts would be found in both. I hope to be able to procure from professor Troost a specimen in that period of gestation.

UNIO TROOSTENSIS. Plate X. fig. 30.

Testâ scalenâ, cuneatâ, obliquâ, valde inæquilaterali; valvulis antice crassioribus; natibus subterminalibus; epidermide luteolâ, radiis capillaribus multis; dentibus cardinalibus elevatis, cristatis; lateralibus subrectis; margaritâ albâ et iridescente.

Shell scaleniform, wedge shaped, oblique, very inequilateral; valves thicker anteriorly; beaks nearly terminal; epidermis yellowish, filled with numerous capillary rays; cardinal teeth elevated, crested; lateral teeth nearly straight; nacre pearly white and iridescent.

Hab. Cumberland River. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.

---

* See ante page 13.

Diam. ·8, Length ·1, Breadth 1·9 inches.

Shell scaleniform, cuneated, oblique, very inequilateral, angular behind; substance of the shell thick before, thinner behind; beaks elevated and rounded; epidermis very finely wrinkled, shining, yellowish brown with numerous green flexuous capillary rays over the whole disk; ligament rather short and thick; cardinal teeth elevated, crenate, deeply cleft in the left valve, and emerging from a pit in the right valve; lateral teeth long and nearly straight; anterior cicatrices distinct; posterior cicatrices nearly distinct; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks very shallow; nacre beautifully pearly white and iridescent.

Remarks.—I owe to the great kindness of professor Troost the examination of his select specimens, which he most obligingly sent to me for that purpose. Among them were two specimens of this rare and beautiful species, unsurpassed by any other in the delicacy and exquisite beauty of its rays. In general form it approaches the *scalenius* (Rafinesque), but differs from it in the form of the rays altogether. It differs also in colour and in having the beaks less retuse. In dedicating this rare and beautiful species to my friend, professor Troost, I do him but an act of simple justice. His constant efforts in the promotion of the physical sciences are known and acknowledged, and his investigation in this branch of conchology will do much to illustrate its history in his adopted state.

UNIO PERDIX. Plate XI. fig. 31.

Testâ ellipticâ, postice subangulatâ, subæquilaterali, inflatâ, transversâ; valvulis subcrassis; epidermide luteolâ, radiis irregulariter interruptis; dentibus cardinalibus elevatis; lateralibus prope eorum fines majoribus; margaritâ albâ et iridescente.

Shell elliptical, subangular behind, nearly equilateral, inflated, transverse; valves rather thick; epidermis yellowish with irregularly interrupted rays; cardinal teeth elevated; lateral teeth larger near their termination; nacre pearly white and iridescent.

Hab. Harpeth River, Tennessee. Professor Troost.
My Cabinet.
Cabinet of Professor Troost, Nashville.

Diam. 1·4,	Length 1·9,	Breadth 3·1 inches.

Shell elliptical, subangular behind, nearly equilateral, inflated, transverse; substance of the shell rather thick; beaks slightly elevated and without undulations at tip; ligament short and thick; epidermis yellowish with irregularly interrupted rays over the whole disk; cardinal teeth elevated, double in the left valve and single in the right; lateral teeth enlarged and disposed to be bladed at the termination; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated along the base of the cardinal tooth and under the plate between the cardinal and lateral teeth; cavity of the beaks wide and obtusely angulate; nacre pearly white, extending only far enough to leave a broad horn coloured border.

Remarks.—This species was among the shells sent to me by professor Troost. To judge from the few specimens I have seen, I should suppose it varied much from age as well as locality. One of my specimens is old and very large, scarcely presenting a ray. In this state it closely resembles the *U. obovatus* (nobis), but is rather more transverse. The younger and more perfect specimens approach more closely to the *U. crassus* (Say), but are more inflated, and differ in the rays, which are broken into irregular spots, not entirely dissimilar to the plumage of the partridge. It has some resemblance to the *U. pictus* herein described, but is not compressed like that species, and differs in the rays. In some specimens the teeth are disposed to be pinkish.

UNIO PICTUS. Plate XI. fig. 32.

Testâ ellipticâ, compressâ, inæquilaterali; valvulis subtenuibus; natibus compressis et ad apices undulatis; epidermide luteâ, radiis tenebroso-viridibus interruptis; dentibus cardinalibus parvis; lateralibus longis et subcurvis; margaritâ albâ et iridescente.

Shell elliptical, compressed, inequilateral; valves rather thin; beaks compressed and undulated at tip; epidermis yellow with interrupted dark green rays; cardinal teeth small; lateral teeth long and slightly curved; nacre pearly white and iridescent.

Hab. Harpeth River, Tennessee. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.

Diam. ·8, Length 1·6, Breadth 2·6 inches.

Shell elliptical, compressed, inequilateral; substance of the shell rather thin, thicker before; beaks compressed and finely undulated at the tip; ligament short and rather thick; epidermis fine yellow with numerous oblique interrupted rays, which are strongly pencilled at the commencement of each stage of growth; cardinal teeth very small and erect; lateral teeth long and slightly curved, in the left valve enlarged near the termination; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks, and deeply impressed; cavity of the beaks very shallow and rounded; nacre pearly white and iridescent.

Remarks.—This species, so beautiful and so peculiar in its painted exterior, I owe to the kindness of professor Troost. The fine specimen figured belongs to the museum of that gentleman in Nashville, and I am indebted to him for the loan of it to insert it here. It belongs to a group, the peculiar character of which seems to be in the singular interruption of the rays, which are obsolete, except at the commencement of each stage of growth, where they are strongly pencilled with green. The *U. planulatus* (nobis), *U. patulus* (nobis) and *U. perdix* (herein described) belong to this group. The *U. pictus* has some resemblance to the *U. cariosus* (Say), but differs in being more compressed, and in having rays over the whole disk. It perhaps more closely resembles the younger specimens of *U. crassus* (Say). It differs, however, in being thinner, smaller, and in the character of the rays.

SYMPHYNOTA DISCOIDEA. Plate XI. fig. 33.

Testâ subrhombeâ, compressâ, transversâ, inæquilaterali, valvulis tenuissimis, postice connatis; natibus paulum undulatis, compressis; dentibus in valvulâ utrâque lineam simplicem facientibus; margaritâ albâ et iridescente.

Shell subrhomboidal, compressed, transverse, inequilateral; valves very thin, connate behind; beaks slightly undulated, compressed; teeth in both valves forming a simple line; nacre white and iridescent.

Hab. . . . . * G. B. Sowerby.
My Cabinet.
Cabinet of Dr Burrough.
Cabinet of W. Hyde.

Diam. 1·2, Length 2·4, Breadth 3·9 inches.

Shell subrhomboidal, compressed, transverse, inequilateral, finely wrinkled; substance of the shell very thin; posterior slope elevated into a moderately high wing, which is connate; beaks very slightly undulated, compressed; ligament linear; epidermis dark brown; teeth in both valves forming a simple, continuous, fine curve line; anterior and posterior cicatrices both distinct; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the beaks almost none; nacre white and iridescent.

Remarks.—I owe to the kindness of G. B. Sowerby, Esq. the specimen here described. He procured it of "a dealer from Holland," and its habitat is unknown. It has the characters of an eastern shell, and probably came from Java. In the outline of the margin it resembles the *Symphynota magnifica* (described in this memoir), but differs from it in being compressed and in the possession of teeth. In the teeth it has a stronger resemblance to the *S. bialata* (nobis) than to any other species. It is, however, less defined, and the curve is less regular, the posterior portion being nearly straight. In the elevation of the wing it differs totally. Our present shell forms an interesting link in the gradual change of the characters of the teeth. It approaches that division of the *Naïades* which do not possess teeth, more closely than any species which has come under my notice.

---

* Dr Burrough has recently obtained it in the rivers of China, and to him I owe the fine specimen figured.

ANODONTA LATO-MARGINATA. Plate XII. fig. 34.

Testâ obovatâ, transversâ, inæquilaterali; intus margine latâ et corneâ; sinu longo et in partem internam disci vergente; valvulis crassis; epidermide rubido-fuscâ; margaritâ albâ et iridescente.

Shell obovate, transverse, inequilateral, interior with a broad horn coloured border; sinus long, and pointed towards the interior of the disk; valves thick; epidermis reddish brown; nacre pearly white and iridescent.

Hab. River Parana, South America. Dr Burrough.
My Cabinet.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Diam. 1·5, Length 2·5, Breadth 3·5 inches.

Shell obovate, transverse, inequilateral, inflated, interior with a broad horn coloured border; sinus long, and pointed to the interior of the disk; substance of the shell thick; beaks somewhat elevated; ligament long and thick; epidermis reddish brown, finely wrinkled, and sometimes obscurely rayed; anterior cicatrices distinct; posterior cicatrices confluent; palleal cicatrices almost imperceptible; dorsal cicatrices apparently none; cavity of the beaks shallow and subangular; nacre pearly white and iridescent, extending only to the broad horn coloured border.

Remarks.—In the collection of Dr Burrough there are several specimens of this species, some of which are young and more rotund than that figured here. It presents several characters unusual in the species of this genus, so far as our knowledge extends. The horn coloured border is even broader than that of the *tenebricosa* herein described, and the apparent absence of the dorsal cicatrices I have never noticed before in any species of the family. The sinus of this species is very remarkable, as well as that of the *tenebricosa*. It does not, however, like that species, curve towards the cavity of the beaks; it stretches in a point towards the centre of the cavity of the disk. In general outline it resembles the *An. Patagonia* (Lam.), but differs in being less rotund, less inflated, and in the nacre being white.

ANODONTA BLAINVILLIANA. Plate XII. fig. 35.

Testâ ovatâ, inflatâ, valde inæquilaterali, antice angulatâ, postice latissimâ, ad marginem anteriorem hianti; cicatrice marginali latâ et postice valde incurvâ; valvulis subcrassis; natibus prominulis; margine dorsali rectâ; margaritâ salmonis colore tinctâ.

Shell ovate, inflated, very inequilateral, angular before, very wide posteriorly, gaping at the anterior and posterior margins; palleal cicatrix broad and much incurved posteriorly; valves rather thick; beaks somewhat prominent; dorsal line straight; nacre salmon and pearly.

Hab. Chili?

My Cabinet.

Diam. 1·3, Length 1·9, Breadth 3 inches.

Shell ovate, inflated, very inequilateral, angular before, very wide posteriorly, the greatest length being perpendicular from the extreme posterior end of the ligament to the basal margin, gaping much at the anterior margin, and rather less at the posterior margin; substance of the shell somewhat thick; beaks rather prominent; dorsal line straight, having a slight elevation under the beak like an incipient tooth; anterior cicatrices complicated but distinct; posterior cicatrices wide and confluent; dorsal cicatrices numerous and stretched in a line across the cavity of the beaks; marginal cicatrix wide, deep and much incurved near to the posterior cicatrix; nacre salmon, beautifully pearly and iridescent.

Remarks.—I accidentally met with this interesting shell at a shop in Havre last October, a few days previously to my embarkation. The two valves belong to different individuals, but they very nearly match. They have both been slightly mutilated by an attempt to *beautify* them, the epidermis having been almost completely removed. What remains indicates it to be greenish, and is sufficient to warrant its being represented in the figure with a perfect epidermis—the ligament has also been destroyed. I was informed by the dealer that it came from Chili; such authority cannot, however, be entirely relied on. The cicatrices of this interesting species are very remarkable, particularly that of the mantle near the margin; the palleal impression is wide, deeply impressed, and in the posterior part of the shell deflected towards the centre of the cavity, somewhat similar to the excavation of the palleal cicatrix of the genera *Galathea* and *Mactra*. The character of this cicatrix is different from that of any species of the family *Naïades* I have seen, and this peculiarity induces me to believe that the animal, when found, may prove to be different from that of the *Anodonta*. Should this be the case, it will belong of course to a new genus, for which I propose the name of *Columba*. It somewhat resembles the *An. exotica* (Lam.). It is, however, narrower before and broader behind than that shell. It gapes anteriorly and posteriorly more than any of the *Naïades* with which I am acquainted. It is perhaps most nearly allied to the *Anodon crassus* (Swainson), but differs in the dorsal line being straight, the nacre being pearly salmon, as well also in the peculiar character of the palleal cicatrix.

ANODONTA TENEBRICOSA. Plate XII. fig. 36.

Testâ ellipticâ, transversâ, inæquilaterâ, intus margine latâ et corneâ; sinu incurvo; valvulis crassis; epidermide tenebroso fuscâ; margaritâ albâ subcæruleâ purpurâ nubilâ, iridescente.

Shell elliptical, transverse, inequilateral, interior with a broad horn coloured border; sinus incurved; valves thick; epidermis dark brown; nacre pearly white, clouded with bluish purple, iridescent.

Hab. River Parana, South America. Dr Burrough.
My Cabinet.
Cabinet of Dr Burrough.
Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. 1·5, Length 1·9, Breadth 3·3 inches.

Shell elliptical, transverse, inequilateral, with a broad horn coloured border, emarginate at base; sinus incurved; substance of the shell thick; beaks scarcely prominent; ligament long and thick; epidermis dark olive brown, wrinkled, obscurely rayed on the posterior slope; anterior cicatrices distinct; posterior cicatrices confluent; palleal cicatrix large and partially tinted with bluish purple; dorsal cicatrix situated in the centre of the cavity of the beaks; cavity of the beaks very shallow; nacre pearly white clouded with bluish purple, extending only to the broad horn coloured border, iridescent.

Remarks.—This curious species is from the collection sent to the Academy of Natural Sciences by Dr Burrough. It differs distinctly from any species known to me. The horn coloured broad border, and the absence of nacreous matter on this part is very remarkable, as is also the close approximation to a perfect ellipsis, the posterior and anterior margins being nearly of the same curve. The clouded bluish purple colour I have never seen in the nacre of any other species. The sinus is so peculiar in the two specimens examined, that I would impress it as important in the character of this species. In the *An. exotica* (Lam.), a South American species, the sinus is generally of the form of an equilateral triangle, the inferior angle being sharp and well defined. In the present species the sinus is still more remarkable, curving in towards the cavity of the beak and terminating with quite an acute angle. The line of the opening of the two specimens is curved and not a plane, as usual with the *Naïades;* and the right beak and margin anterior to it, overwrap in a small degree the left beak and valve. In the old specimen this extension of the margin passes the other more than an eighth of an inch—consequently the shell might almost be said to be inequivalve. In its general characters this species most resembles the *sinuosa* of Lamarck.

ANODONTA MORTONIANA. Plate XIII. fig. 37.

Testâ subellipticâ, postice sub-biangulatâ, transversâ, valde inæquilaterali ; valvulis crassis ; epidermide perfuscâ ; clivo umboniali sulcato ; margaritâ argenteâ et iridescenti.

Shell subelliptical, sub-biangular behind, transverse, very inequilateral ; valves thick ; epidermis intensely brown ; umbonial slope furrowed ; nacre silvery and iridescent.

Hab. River Parana, South America. Dr Burrough.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of Dr Burrough.

Diam. 1·2, Length 1·6, Breadth 3 inches.

Shell subelliptical, sub-biangulate behind; transverse, very inequilateral, somewhat inflated, furrowed from the beak to the posterior margin along the umbonial slope; substance of the shell thick; beaks retuse and scarcely prominent; ligament long and narrow; epidermis intensely brown and finely wrinkled; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices apparently none; cavity of the beaks subangular and shallow; nacre silvery white and iridescent.

Remarks.—A single specimen of this species, which is distinct from any described *Anodonta* I have seen, was sent to the Academy by Dr Burrough. It is remarkably thick, silvery and iridescent, and has an exceedingly dark epidermis. It most resembles, perhaps, the *elongatus* of Swainson. It is less transverse than that shell, rounded only anteriorly; it differs in not having "a strong flesh coloured tinge," and is by no means so bright a brown as his beautiful figure.

Named after S. G. Morton, M.D., corresponding secretary of the Academy of Natural Sciences of Philadelphia.

MELANIA ACULEUS. Plate XIX. fig. 72.

Testâ acuto-elevatâ, lævissimâ, tenebroso-corneâ; apice acutissimo; anfractibus circiter duodecim, subconvexis; labro expasso.

Shell acutely elevated, very smooth, dark horn colour; apex very acute; whorls about twelve, somewhat convex; labrum spread out.

Hab. Java?

My Cabinet.

Diam ·6, Length 2 inches.

Remarks.—I purchased this, with some other of the shells described in this memoir, from the collection brought from Java by Mr Shillaber. It is remarkable for its attenuated form and tapering spire. It is more than usually spread out at the base. The substance of the shell is thin and bluish white. The last whorl is much enlarged. The aperture occupies about one-third of the length of the shell.

LYMNÆA IMPERIALIS. Plate XIX. fig. 73.

Testâ ovato-ventricosâ, pellucidâ, tenuissimâ, albido-corneâ, subcoronatâ; apice obtuso; anfractibus quaternis, inflatis, ultimo maximo; aperturâ magnâ, ovatâ; labro valde extenso.

Shell ovato-ventricose, diaphanous, very thin, light horn colour, subcoronate; apex obtuse; whorls four, inflated, the last very large; aperture large, ovate; outer lip much extended.

Hab. South America?

My Cabinet.

Diam. ·9, Length 1·4 inches.

Remarks.—I accidentally met with this rare and interesting shell at a dealer's in Paris. I saw no other specimen in any of the great collections in Europe. The person from whom I obtained it informed me it came from South America. It is more inflated than any species with which I am acquainted; but what eminently distinguishes it is the subcoronate apex which, as far as we yet know, is peculiar to this species. The body whorl nearly envelopes the superior ones. When examined by the microscope, transverse striæ are observed to cause numerous minute depressions on its surface.

MELANOPSIS PRINCEPS. Plate XIX. fig. 74.

Testâ acuto-elevatâ, lævi, rufo-fuscâ, obsolete multimaculatâ; inferiori anfractu carinato, dimidio basali transversim striato; apice acuto; anfractibus plus minus quatuordecim, planis; aperturâ quintâ parte testæ.

Shell acutely elevated, smooth, transversely striate on the lower half of the body whorl, which is carinate, reddish brown, with numerous indistinct spots; apex acute; whorls about fourteen, flat aperture one-fifth the length of the shell.

Hab. Cape of Good Hope.

My Cabinet.

Diam. ·6, Length 2·1 inches.

Remarks.—This is the most remarkable species of the genus which I have examined. It differs from any described species in its great elevation, in the flatness of its whorls, in its being covered with indistinct spots, and in the absence of a large callus on the superior part of the inner lip, as well also as in the great number of its whorls. The spots are peculiar in being chain-like, alternately darker and lighter. The operculum is horny, like that of the genus *Melania.*

MELANOPSIS MACULATA. Plate XIX. fig. 75.

Testâ fusiformi, tenebroso-olivaceâ, intus fasciatâ; epidermide maculatâ; anfractibus quaternis; basi subtruncatâ; columellâ sine callo superno.

Shell fusiform, dark olive, banded on the inside, and spotted in the epidermis; whorls four; base but slightly truncate; columella not thickened above.

Hab. Peru. Lieutenant Humphreys.

My Cabinet.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. ·3, Length ·5 inches.

Remarks.—The genus *Melanopsis*, a few years since, presented, to our knowledge, only two species. These were described by Lamarck. The rapid advancement of our science has recently brought to light many new ones. I have eight species in my own cabinet, and in this memoir I add two species to the ten now known. These two are peculiarly and beautifully spotted in the epidermis. The two specimens brought by lieutenant Humphreys have each four transverse purple bands on the inside, and the dark olive epidermis is filled with very distinct intensely dark brown quadrate spots. This species, and the *princeps* herein described, form a division in the genus *Melanopsis* of Lamarck which genus should be altered, leaving out the character of the callus on the upper part of the columella. Neither of these has that character, but, notwithstanding, should not be removed to a new genus, as it is, independent of that, a perfectly natural one.

AURICULA FUSCAGULA. Plate XIX. fig. 76.

Testâ fusiformi, albidâ, pellucidâ; suturis impressis et albo-lineatis; labro late reflexo; gulâ fuscâ et dentibus novenis munitâ.

Shell fusiform, whitish, diaphanous; sutures impressed and presenting a white line; outer lip widely reflected; throat dark brown and furnished with nine teeth.

Hab. Brazil.

My Cabinet.

Cabinet of P. H. Nicklin.

Diam. ·4, Length 1·1 inches.

Remarks.—This is a very remarkable and interesting species. In its general form and aperture it resembles a *Clausilia.* Like some species of that genus its mouth is studded with teeth. Of the nine, seven are on the outer lip—the last of these and the first on the columella are the largest. The deep brown of the throat is visible through the shell. In some specimens there is a finely mottled appearance over the lower whorls of the shell. The white line along the suture is placed on the upper part of the whorl. The outline of the shell is remarkably fusiform.

CYCLOSTOMA STRIATA. Plate XIX. fig. 77.

Testâ depressâ, planulatâ, multistriatâ, albâ, pellucidâ, latissime umbilicatâ; anfractibus quaternis; apice acuminato, rufo; labro acuto; operculo corneo tenuique.

Shell depressed, flattened, much striate, white, translucent, very widely umbilicate; whorls four; apex red and pointed; lip sharp; operculum thin and horny.

Hab. Peru. Lieutenant Humphreys.

Cabinet of the Academy of Natural Sciences of Philadelphia.

Diam. ·9, Length ·5 of an inch.

Remarks.—This shell was brought by lieutenant Humphreys from South America, and presented, with many other fine specimens, to the Academy. It resembles the *C. Jamaicensis* (Fer.); but is much larger, and has finer striæ. The rotundity of the mouth is slightly modified by the junction of the superior part with the columella.

ACHATINA VANUXEMENSIS. Plate XIX. fig. 78.

Testâ fusiformi, tenui, pellucidâ, longitudinaliter et transversim striatâ, luteâ, in anfractum infernum obsolete albo-maculatâ; suturis granulatis; canali baseos curvo.

Shell fusiform, thin, pellucid, longitudinally and transversely striate, ochre coloured, with indistinct white spots on the body whorl; sutures granulate; channel curved at the base.

Hab. Mexico. Professor Vanuxem.
My Cabinet.
Cabinet of Professor Vanuxem.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Cabinet of P. H. Nicklin.
Diam. 1·2, Length 2·5 inches.

Remarks.—Among the shells brought from Mexico by professor Vanuxem, was this fine *Achatina*, which belongs to Lamarck's second division of this genus. It very closely resembles the *Buccinum striatum* (Chem.), *Polyphemus glans** (Say), *Glandina* (Say). It differs from it in having crenulated sutures, and in having fine transverse lines, as well as longitudinal striæ. The indistinct opake white spots, which are more frequent on the front of the body whorl, are, I believe, peculiar to this species. It is larger by one-third than any individual of the *striata* which I have seen.

In concluding these descriptions and observations, I will take advantage of the opportunity to express my thanks to those gentlemen who have kindly assisted me with new shells and rendered other friendly offices. Among these I have been particularly obliged by Philip H. Nicklin, Esq., William Cooper, Esq. and professor Troost. To the Academy of Natural Sciences of Philadelphia an acknowledgement is due, for the liberal and unhesitating vote which it passed, to permit me to describe for our Transactions the new species in their splendid and highly useful collection.

I will take this opportunity also to correct the habitat of the *Unio brevidens* (ante page 85), which professor Troost thinks has not been found in the Ohio, but only in the Cumberland. The specimen which Mr Cooper kindly gave to me to be described, came, I believe, originally from professor Troost. The specimen figured was not more than half grown. The older individuals usually have an arched ridge along the umbonial slope near to the margin, the edges of each growth being there dentate. In some specimens this is so strongly marked as to resemble a thick cord. The *Arcæformis*, professor T. doubts being in Tennessee river. He found it only in the Cumberland. He was, I believe, the first person who sent this species to New York and this city. Some fine old specimens, recently received from that gentleman, exhibit a diameter of a most extraordinary nature, as well also an almost perfect flatness of the posterior slope. My oldest specimen, when placed on a plane, will rest both on the base and on that slope. The specimen figured by me, was not more than two-thirds grown, and was then the best specimen I had seen, and I supposed it to be an adult.

---

* *Cochlicopa rosea* (Fer.). It should now be called *Achatina striata*, unless the generic name be changed, the propriety of which I doubt.

OBSERVATIONS ON LAMARCK'S NAIADES.

HAVING had the opportunity while in Paris recently, to inspect most of the cabinets to which Lamarck refers in his description of the *Naïades*, I seized the opportunity to examine the *individual specimens* from which he made his descriptions; and having made notes on the spot, I feel great confidence as to the facts, and trust that my judgment as to the decisions on his species will be found to be correct.

In pointing out the errors of this great zoologist, we must not be astonished at their number, nor should the slightest shadow fall upon his merited and exalted reputation. We should rather think of the means within his power, the poverty of the materials with which he worked, and above all, the unfortunate ophthalmia which afflicted his declining years, and which he deplores in the advertisement of the sixth volume of his Hist. Nat. des Animaux sans Vertèbres.

Unio sinuata. This is a true species, but Klein is entitled to the name which he gave first to it, viz. *crassissima.*[*] It has been considered by the conchologists of this country (and I certainly was of the same opinion) to be the *Mya margaritifera* of Linnæus. It has all the characters of this species, with the exception of the addition of the thick lateral tooth, which our author does not describe, but could scarcely have failed to have observed. Being possessed of this tooth, it is of course a true *Unio.* Pfeiffer describes an old *margaritifera* under the name of *sinuata.* He says "dente cardinali valido, subconico, laterali nullo." In the north of Europe, (for the *sinuata* exists only in the south) he had not, perhaps, like ourselves, until recently, an opportunity of examining the true *sinuata* of Lamarck.

---

[*] See Transactions of the Linnean Society of Bourdeaux, Vol. II. p. 42.

Unio elongata. This is the true *Mya margaritifera* of Linnæus and other authors. The *Alasmodonta arcuata* of Barnes is its analogue in this country. It inhabits the north of Europe, lake Ladoga, Norway, &c.

Unio crassidens. The specimen quoted from Lamarck's own collection, which is now in the possession of the Duke de Rivoli, is the *cuneatus* of Barnes. Var. *a* is the *trapezoides* (nobis), a shell very different in its general characters, being always folded. *Crassidens* therefore has precedence of *cuneatus.*

Unio Peruviana. This is the *plicatus* of Le Sueur, now so well known in all our collections. Valenciennes says, Dombey's shell remains in the museum, and that Lamarck described a North American shell in error. The figure referred to by Lamarck, in the Ency. Methodique, is certainly the well known *plicatus* of our western waters.

Unio purpurata. Lamarck supposed the specimens he examined to have come from Africa. I examined the specimen cited, in the Duke de Rivoli's collection, as well, also, one in that of Baron de Ferussac. These specimens have been polished, and have, most probably, been in the cabinet of Paris for twenty or thirty years; for, few *Uniones* were admitted into the cabinet, at that time, without the loss of their superficial protection. It is the *ater* (nobis), and, most probably, was taken from the neighbourhood of New Orleans, while in possession of the French. The specimen described and figured in one of my former memoirs, came from Port Gibson, below Natchez; and I subsequently received some from the vicinity of New Orleans and from Claiborne, Alabama. I therefore, willingly yield the name to Lamarck.*

---

* In the "American Conchology," No. V., Mr Say re-describes and re-figures the *Unio*

Unio ligamentina. The specimen in the Garden of Plants is the *U. crassus* of Say.

Unio obliqua, in the same collection is the *U. undatus* of Barnes.

Unio retusa. This is the *U. torsus* (Rafinesque). The locality given is Nova Scotia; the correctness of which I doubt much. It is, as yet, known to exist only in our western waters.

Unio rarisulcata. The specimen in the Garden of Plants is the *complanatus* (Soland.), *purpureus* of Say.

Unio coarctata. The specimen in the collection of the Duke de Rivoli is the *complanatus* (Soland.). The observation of Lamarck, that "it is the analogue of our *U. margaritifera*," (he ought to have said *elongata*, for he does not use the name of *margaritifera*) must be an error. The American shell, described by Barnes as *Alasmodonta arcuata*, is the unquestionable analogue of the true *Mya margaritifera* (Linn.), and a very different shell, not having a lateral tooth, and belonging to Schumacker's genus *Margaritana* (Say's *Alasmodonta*).

Unio purpurascens. This is also a *complanatus*, in the museum of the Garden of Plants.

Unio radiata. The specimen at the Garden of Plants is the true *radiatus.* The *Unio ochraceus* (Say), given as a synonyme, is a very distinct species.

Unio brevialis. The specimen at the Garden of Plants resembles so closely the *U. littoralis*, that I am induced to believe it never came from the Isle of France, and that it is of European origin. That in Baron de Ferussac's cabinet is certainly an old *littoralis.* The shell figured by Crouch, under the name *brevialis*, is entirely distinct.

Unio rhombula. The specimen now in the cabinet of the Duke de Rivoli* is a young and bad specimen of the *complanatus*, and certainly from the United States, and not Senegal. Var. *b*, in the cabinet of Valenciennes, I did not see.

---

ater, under the name of *U. lugubris*, alleging that the name *ater* is "preoccupied by Nilsson for a very distinct species." Mr S. does not seem to be aware, that Nilsson's *ater* is only a variety of *U. Batava*, of Maton and Racket; and, therefore, could not affect my claim. We must both yield to the prior claim of Lamarck.

* I ought to say that the Duke keeps the cabinet of Lamarck intact, as much as possible, and, therefore, the shells quoted may be relied on as being the same as described by Lamarck.

Unio carinifera is also the *complanatus*, which inhabits so large a space of our country east and west of the Alleghany mountains.

Unio Georgina is also from the mine *complanatus.*

Unio clava. This is the *scalenia* of Rafinesque: *modioliformis* of Say.

Unio recta is Barnes's *prælongus.* Lamarck has precedence.

Unio naviformis. This is the *cylindricus* of Say, who has precedence.

Unio glabrata. This is the *complanatus.* The specimen in the Duke de Rivoli's cabinet is most likely from our eastern waters.

Unio nasuta. The specimen from which this description was made, is now in the museum of the Garden of Plants. It is a young *gibbosus* of Barnes. It is not the same with Say's *nasutus*, as Lamarck suspected it to be. As Lamarck described the shell before Barnes, he has a claim for the species; but having used a name pre-occupied by another shell, he loses it. I therefore would continue Mr Barnes's name *gibbosus.*

Unio ovata is the *ovatus* of Say. Var. *b*, I was not enabled to see —from the description I presume it to be a variety of *occidens* (nobis).

Unio rotundata. The specimen shown to me by Baron de Ferussac, whose cabinet is cited for one of the two specimens seen by Lamarck, is a small *suborbiculata* (Lam.), a large specimen of which the baron had the goodness to give me, and I have reason to believe it to be the individual cited by Lamarck. It is the *subglobosus* (nobis), and the *glebulus* of Say.

Unio littoralis. This interesting species inhabits most parts of Europe. It has been brought also from the Tigris by some of the French scientific expeditions, and I owe to the kindness of the administration of the Garden of Plants a fine specimen from Bagdad. The specimens from this locality are less transverse, and Lamarck considered the difference sufficient to found a species, *semirugata*, by which name they are labelled in that institution. After examining carefully suites from Europe and Asia with Baron de Ferussac, he accorded with me in opinion, that there was not sufficient difference to warrant their separation.

After examining numerous specimens in Europe of the *littoralis*, I have strong doubts if the shell described by me in a former memoir, under the name of *incurvus*, be not a peculiar variety of it. It certainly has a marked similarity to a fine transverse specimen of *littoralis*. The specimen from which my description was made, was sent to me as a "non descript from Gibraltar," by Mrs Mawe. I had not at that time seen very fine specimens of the *littoralis*, and it did not strike me that there was a similarity to such as I had. While in London, that excellent conchologist, Mr G. B. Sowerby, showed me a specimen precisely similar to mine, and which I think he informed me was from the collection of the veteran Humphreys. In one valve was marked in ink "Brazil;" in the other the name of the person who is supposed to have brought it from that country.

Unio semirugata. The specimen which I examined in the Duke de Rivoli's cabinet, is the one mentioned as being in Lamarck's own cabinet. It is a young *littoralis*, with rather more undulations than usual.

Unio nana. I saw this species only in the collection of Baron de Ferussac. All the specimens were old and depauperated, and their similarity to *littoralis* so great, as to induce me to believe that when better individuals are procured, they will easily be referred to that species.

Unio delodonta. The specimen cited, and which I examined in the cabinet of the Duke de Rivoli, I suspect to be the *lacteolus* (nobis). It has the beaks eroded, and therefore does not present the peculiar character of radiating folds at the point of the beaks, which is consequently omitted in Lamarck's description.

Unio sulcidens. In the Duke de Rivoli's collection—it is a compressed *complanatus* (Soland.), from the Connecticut River, where this species is more disposed to assume that character than in any river in the United States with which I am acquainted.

Unio rostrata. This is one of the numerous species made from the *pictorum* of authors. It is merely an elongated variety of that species in all the cabinets where I have seen it in Europe.

Unio Batava. This is a distinct species from *pictorum*. Baron de Ferussac thinks that Maton and Racket are entitled to the species.

Lamarck cites Schroeter first. I have not an opportunity to examine Schroeter's work.

Unio nodulosa. This is a young individual of the *ovata* of Donovan, and no doubt the specimen cited never was out of Europe. The *ovata* is emphatically an European shell, and has served, like the *pictorum*, to which it has some resemblance, to make numerous species. Lamarck's habitat (lake Champlain) is certainly an error.

Unio varicosa. The specimen described by Lamarck is still in his original cabinet. It is a young and bad specimen of the *Alasmodonta marginata* (Say). From the description I formerly supposed it to be *Alas. undulata* (Say).

Unio granosa. The only specimen of this beautiful and distinct species I saw in Europe, is in the Garden of Plants. It is unique in the possession of disks completely covered with minute granular elevations.

Unio depressa. The specimen in the Duke de Rivoli's collection is marked "from Peru," and is a very different species from one which I procured in Paris, marked by Lesson as *depressa* from New Holland. Lamarck's description is so extremely vague, that it almost equally well applies to both. The shell from Peru, of which I have several specimens, is more transverse than that from New Holland, which I presume should be considered the true *depressa*.

Unio Virginiana. This is a bad specimen of *radiatus*, in the Duke de Rivoli's collection.

Unio luteola. From the description and locality, I formerly supposed this to be Say's *cariosus*. On examining the specimen at the Garden of Plants, cited by Lamarck, I found it to be a true *siliquoideus* of Barnes, which sometimes approaches the *cariosus*. There must be an error in the locality given by Lamarck, as this species does not inhabit the waters east of the Alleghany mountains. Lamarck's name has precedence to that of Mr Barnes.

Unio angusta. This is a distinct and interesting species. Its habitat is unknown, and the only specimen I have seen is in the collection at the Garden of Plants.

Unio manca. I examined the original specimen in the cabinet of

Baron de Ferussac, which Lamarck described, and I convinced the Baron that it was only a *pictorum*.

Unio cariosa. The two specimens described are both in the cabinet of the Duke de Rivoli. The first is a bad specimen of Say's *cariosus*. The other (Var. 2) is a bad specimen of the *Alasmodonta marginata* (Say). One of the habitats, Lake Erie, is an error; it is found only in our waters east of the Alleghany mountains.

Unio spuria. This species is mentioned by Lamarck as being in the museum of the Garden of Plants. I did not see it there, nor do I know it to be in any other collection.

Unio australis. The same remarks apply to this species.

Unio anodontina. I examined the individual described under this name in the collection of the Duke de Rivoli. It proved to be a specimen of *U. marginalis*, which species is yet known to inhabit only the fresh waters of India. Lamarck says it comes from Virginia, which is certainly an error.

Unio suborbiculata. This is only a *rotundata*, as mentioned before in my observations on that species.

Hyria avicularis. This is the *Mya syrmatophora* of Gronovius, Gmel., Dill., &c.: *avicularis* should therefore be abandoned. Lamarck is not certain of the habitat of his specimen, but believes it to be from Brazil. I have seen in Paris a specimen brought by Spix from that country.*

Hyria corrugata is remarkable for the folds on the umbones, and is a very distinct species.—They are both in my cabinet.

Anodonta cygnea. The well known *Mytilus cygneus* of Linnæus and others. Of the various forms of this there have been created perhaps a dozen different species.

Anodonta anatina resembles very closely the *cygnea*, but is most probably a distinct species. Poiret asserts that this species is oviparous, while the *cygnea* is viviparous. Should this prove true, they must of course be considered distinct.

---

* This traveller brought also the *Castalia ambigua*, which, Lamarck says, seems to be fluviatile, but which he nevertheless separates from the *Naïades*, to which it naturally belongs, and not to the family *Trigoniana*. Both the shells are figured in Spix's beautiful work, but described with too little attention to previous writers.

Anodonta sulcata. I saw in the Duke de Rivoli's cabinet the specimen described by Lamarck. It is a variety of the *A. cygnea*, and I presume is from Europe. The *cygnea* has no analogue in the United States, with which I am acquainted.

Anodonta fragilis. Baron de Ferussac gave me a specimen of this species, brought by Monsieur Lapylaie from Newfoundland. When I first saw it in Paris, I recognized it instantly to be similar to specimens I had found in lake Skaneateles, nearly six years since, but which I had not yet published.

Anodonta rubens. This interesting species is perhaps the most ponderous of the genus. It inhabits the Nile as well as the Senegal. My specimen, from the latter river, is heavier and more inflated than those which I have from the Nile. Deshayes places it in the genus *Iridina*, asserting that the animal differs from the *Anodonta*, and is similar to that of the *Iridina*.

Anodonta crispata. This is a distinct and beautiful species, peculiar for its transverse furrows. I owe to the kindness of Baron de Ferussac the possession of this rare shell, the habitat of which is Cayenne. Lamarck says, "dans les rivières des regions australes?"

Anodonta uniopsis is a distinct species, and probably from New Holland.

Anodonta Pennsylvanica. I examined the specimen described by Lamarck. It is in the cabinet of the Duke de Rivoli, and is the same with the *undulata* of Say, *rugosus* of Swainson.

Anodonta intermedia is a variety of *anatina*. The *intermedia* of Pfeiffer is a variety of *cygnea*.

Anodonta trapezialis. The specimen described by Lamarck is in the Garden of Plants. It is the *giganteus* of Spix, who figures it in his beautiful work. Its habitat is Brazil. Lamarck says, "des eaux douces étrangères à celles de l'Europe?" It is less transverse, and has more volume than the following, which it closely resembles.

Anodonta exotica. I examined specimens of this species in the cabinets of the Duke de Rivoli, Baron de Ferussac and the Garden of Plants. Lamarck's habitat says, "les rivières de l'Inde?" I believe it comes only from the more southern rivers of South America. My specimens, and those I saw in Europe, came from the river La Plata. It has a peculiar character, which Lamarck does not notice, in the deposit of epidermal matter at different stages of growth, with the nacre extending in waved lines, generally from one great cicatrix to the other, forming curves parallel with the palleal cicatrix.

Anodonta glauca is a distinct species, inhabiting Mexico, and figured in a recent number of Humboldt's great work.

Anodonta sinuosa. I saw the specimen described, in Baron de Ferussac's cabinet. It is very distinct, and very peculiar in the sinuous dorsal line. This species is in my cabinet.

Anodonta Patagonica. This is also a distinct and very rare species. The possession of a specimen I owe to the kindness of Mr G. B. Sowerby.

Iridina exotica. To Baron de Ferussac I owe the possession of this species. It appears to differ from the *Nilotica* in being *tuberculated* along the dorsal line, which is one of Lamarck's generic characters. The *Nilotica*, which I received from the African traveller Monsieur Cailliaud, has no crenulations along the dorsal line, but I have seen specimens on which a few could be observed. The *Clappertoni* of Denman is a young *Nilotica.*

SECOND SUPPLEMENT.

Read before the American Philosophical Society, February 7th, 1834.

UNIO SHEPARDIANUS. Plate XIII. fig. 38.

Testâ sublanceolatâ, transversissimâ, valde inæquilaterali, antice rotundatâ, postice obtuso-angulatâ, inferne emarginatâ, ad latera planulatâ ; clivo umboniali elevato ; valvulis subcrassis ; natibus parvis, prope marginem anteriorem positis ; epidermide tenebroso-fuscâ, obsolete radiatâ ; dente cardinali obliquo, in valvulâ dextrâ unico, in sinistrâ duplici ; dente laterali longissimo rectoque ; margaritâ purpureâ et iridescente.

Shell sublanceolate, very transverse, very inequilateral, rounded before, obtusely angular behind, emarginate at base, flattened on the sides ; umbonial slope elevated ; valves somewhat thick ; beaks small and placed near the anterior margin ; epidermis dark brown with obsolete rays ; cardinal teeth oblique, single in the right and double in the left valve ; lateral teeth very long and straight ; nacre purple and iridescent.

Hab. Hopeton, near Darien, Georgia. Professor Shepard.
My Cabinet.
Cabinet of Professor Shepard.

Diam. 1, Length 1·4, Breadth 5 inches.

Shell sublanceolate, very transverse, very inequilateral, rounded before, obtusely angular behind, emarginate at base, flattened over the umbones and sides; umbonial slope forming an oblique ridge; substance of the shell rather thick; beaks small and placed near to the anterior margin; ligament thin and long; epidermis dark brown, almost black, with obsolete rays on the more perfect individuals; cardinal teeth erect, single in the right valve and double in the left; lateral teeth very long and straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks: cavity of the beaks very shallow; cavity of the shell deep under the umbonial slope; nacre beautifully purple and iridescent.

Remarks.—This remarkable species, in its great transverseness and outline, has some resemblance to *U. Grayanus* (nobis). It is much more transverse than any species heretofore discovered from this country. The purple of the interior is like that of the *complanatus* (Soland.). In one specimen there is a muscular impression near the centre of the cavity of the shell, similar to that of the *U. trapezoides* (nobis). In another specimen there are obsolete marks of an impression. The third has none that can be distinguished.

I am indebted to the great kindness of professor Shepard of New Haven for this interesting and curious species, and it is with pleasure I dedicate it to him.

UNIO FULVUS. Plate XIII. fig. 39.

Testâ angusto-ellipticâ, inæquilaterali, transversâ, posticè subangulatâ; clivo umboniali rotundato; valvulis tenuiculis; natibus prominulis; epidermide luteâ; dente cardinali obliquo, laterali subcurvo; margaritâ salmonis colore tinctâ.

Shell narrow-elliptical, inequilateral, transverse, subangular behind; umbonial slope rounded; valves rather thin; beaks slightly elevated; epidermis yellow; cardinal teeth oblique; lateral teeth somewhat curved; nacre salmon.

Hab. . . . . , South Carolina. Dr Blanding.
My Cabinet.
Cabinet of Dr Blanding.

Diam. ·6, Length ·9, Breadth 1·6 inches.

Shell narrow-elliptical, inequilateral, transverse, slightly inflated; umbonial slope rounded; substance of the shell rather thin; beaks slightly elevated, placed towards the anterior margin; ligament thin and rather short; epidermis yellow and yellowish brown; cardinal teeth oblique, short, disposed to be lobed, single in the right and double in the left valve; lateral teeth slightly curved, rather long; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the beaks very shallow; cavity of the shell somewhat deep; nacre salmon.

Remarks.—This species has, perhaps, most resemblance in its exterior to the *marginalis* (Lamarck), which comes from the great rivers of India. In the interior, however, it differs much. Our shell is of a very dark salmon colour. It is also a thicker shell, and the teeth are much thicker. In the colour of the epidermis it somewhat resembles the *lanceolatus* (nobis).

UNIO MODIOLIFORMIS. Plate XIII. fig. 40.

Testâ ovatâ, transversâ, inæquilaterali, inflatâ, antice angustâ, postice latâ; valvulis tenuissimis; natibus minutis et fere terminalibus; dentibus cardinalibus parvis, compressis, lateralibus longis curvisque; margaritâ subpurpureâ, valde iridescenti.

Shell ovate, transverse, very inequilateral, inflated, narrow before and broad behind; valves very thin; beaks small, nearly terminal; cardinal teeth small, compressed; lateral teeth long and curved; nacre slightly purple, very iridescent.

Hab. Santee Canal, South Carolina. Professor Ravenel.
My Cabinet.
Cabinet of Professor Ravenel.
Cabinet of P. H. Nicklin.

Diam. 1·1, Length 1·5, Breadth 2·7 inches.

Shell reversely ovate, transverse, very inequilateral, inflated, narrow before and broad behind, emarginate at basal margin; substance of the shell very thin, diaphanous; beaks small, nearly terminal, slightly undulated; ligament rather long and thin; epidermis brown, shining; rays indistinct; cardinal teeth small, compressed, disposed to be double in the left and single in the right valve; lateral teeth long, curved and elevated in their direction; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices small, situated in the cavity of the beaks; cavity of the shell deep; cavity of the beaks shallow; nacre slightly purple, very iridescent.

Remarks.—The spreading out of the posterior portion of the shell, and the narrowness of the anterior portion, is very striking in this species. I know of no other species which has its lateral teeth so much elevated, following, as they do, the widened margin of the valve. The cardinal teeth are generally double in the left valve, but not always. They will always be found to be compressed in both valves, and generally more elevated in the right. The nacre is so very thin as to be diaphanous, and the play of iridescent colours is very beautiful. As the individual advances in age the marks of growth form large wrinkles, and it then becomes more cylindrical.

UNIO KIRTLANDIANUS. Plate XIV. fig. 41.

Testâ subrotundâ, compressâ; valvulis crassis; natibus subprominentibus; epidermide circa nates luteâ, juxta marginem fuscâ; radiis interruptis; dentibus cardinalibus subcrassis, lateralibus subcurvis brevibusque; margaritâ albâ et iridescente.

Shell rather round, compressed; valves thick; beaks somewhat elevated; epidermis yellowish about the beaks, brown towards the margin; rays interrupted; cardinal teeth rather thick; lateral teeth short and slightly curved; nacre pearly white and iridescent.

Hab. Mahoning, Ohio. J. P. Kirtland, M.D.
My Cabinet.
Cabinet of P. H. Nicklin.

Diam. 1, Length 2, Breadth 2·3 inches.

Shell rather round, compressed; substance of the shell thick, somewhat thinner behind; beaks rather elevated; ligament rather short and thick; epidermis wrinkled, dark brown, smooth and yellowish in the region of the beaks; interrupted rays pass from the beaks and are very visible over the umbones, but are lost in the wrinkles before they reach the margin; cardinal teeth rather thick; lateral teeth short, thick and slightly curved; posterior and anterior cicatrices both distinct; dorsal cicatrices situated on the under side of the cardinal teeth; cavity of the shell flat and shallow; cavity of the beaks rather deep and angulated; nacre pearly white and iridescent.

Remarks.—I owe this new species to the kindness of Dr Kirtland of

Poland, Ohio. It is very nearly allied to the *subrotundus* (nobis), and when I first received a few specimens, I doubted if it was more than a variety of that species. Subsequently receiving from the same naturalist more and better specimens, I was satisfied that it was specifically different. Specimens of the true *subrotundus* having accompanied these, it could not be, of course, a variety occasioned, as is sometimes the case, by mere locality. It differs from the *subrotundus* in being much flatter, in having smaller beaks, and in being of a darker brown—the beaks are less yellow—the rays, interrupted like that shell, tend generally nearer to the margin. In older specimens than the one figured, the posterior part becomes protruded, which gives an obliqueness to the shell.

Unio Paranensis. Plate XIV. fig. 42.

Testâ subrotundatâ, inæquilaterali, compressâ; valvulis subcrassis; natibus plicatis retusis; dentibus cardinalibus recurvis, in valvulâ utrâque duplicibus; lateralibus sublongis curvisque; margaritâ albâ et iridescente.

Shell subrotund, inequilateral, compressed; valves somewhat thick; beaks folded, retuse; cardinal teeth recurved, double in both valves; lateral teeth rather long and curved; nacre pearly white and iridescent.

Hab. River Parana. Dr Burrough.
Cabinet of Dr Burrough.

Diam. 1·3, Length 3, Breadth 3·5 inches.

Shell subrotund, disposed to be pentagonal, inequilateral, compressed towards the margin, emarginate on the posterior dorsal margin; umbonial slope flattened; substance of the shell somewhat thick; beaks rather elevated, longitudinally folded, retuse; ligament rather long and thin; epidermis wrinkled, shining, greenish on the beaks and brown towards the margin, furnished with very obscure curved rays, which sweep from the beak towards the anterior part; cardinal teeth recurved, compressed, double in both valves; lateral teeth lamellar, rather long and curved; anterior cicatrices confluent; posterior cicatrices confluent;

dorsal cicatrices in the centre of the cavity of the beaks; palleal impression small and distant from the margin; cavity of the shell very shallow; cavity of the beaks small, subangular; nacre pearly white and iridescent.

Remarks.—I am indebted to the kindness of Dr Burrough for the advantage of examining and describing this interesting species. It was procured by him, during his late voyage round the world, at Buenos Ayres, having been brought from the river Parana. It is remarkable for its outline, its expanded basal margin and folded beaks.

Unio Nashvillianus. Plate XIV. fig. 43.

Testâ ellipticâ, transversâ, inæquilaterali; valvulis subcrassis; natibus prominulis et minute undulatis; dentibus cardinalibus laminatis et in valvulâ utrâque duplicibus, lateralibus subrectis; margaritâ albâ.

Shell elliptical, transverse, inequilateral; valves somewhat thick; beaks slightly elevated and minutely undulated; cardinal teeth lamelliform and double in both valves; lateral teeth nearly straight; nacre pearly white.

Hab. Cumberland River. Professor Troost.
Ohio, at Louisville. Dr Fitch.
My Cabinet.
Cabinet of Professor Troost.

Diam. ·9, Length 1·4, Breadth 2·5 inches.

Shell elliptical, sometimes truncate behind, transverse, inequilateral; substance of the shell somewhat thick; beaks slightly elevated and minutely undulated at the tip; ligament rather short and straight; epidermis dark brown, obscurely rayed; cardinal teeth lamelliform, disposed to be crenulate, double in both valves; lateral teeth nearly straight, the inferior section in the left valve being enlarged towards the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the beaks angular, rather shallow; nacre beautifully pearly white, disposed in many individuals to be pinkish on the posterior part of the shell.

Remarks.—This species has most resemblance in its general characters to the *parvus* (Barnes). It is, however, a larger shell, and in the undulations of the beaks it is very different. Like the *parvus*, the *siliquoideus*, the *cariosus* and *crassus*, it is sometimes very much truncated behind. In this state it might be mistaken for a different species, did not, as in the abovementioned species, the other characters strictly identify it.

UNIO BLANDINGIANUS. Plate XV. fig. 44.

Testâ subtrapezoideâ, transversâ, inæquilaterali, subinflatâ; valvulis tenuibus; natibus prominulis; dentibus cardinalibus compressis; lateralibus longis curvisque; margaritâ purpureâ.

Shell subtrapezoidal, transverse, inequilateral, somewhat inflated; valves thin; beaks somewhat prominent; cardinal teeth compressed; lateral teeth long and curved; nacre purple.

Hab. St John's river, ? Florida. Dr Blanding.
My Cabinet.
Cabinet of Dr Blanding.

Diam. ·9, Length 1·5, Breadth 2·3 inches.

Shell subtrapezoidal, transverse, very inequilateral, somewhat inflated; substance of the shell thin; beaks somewhat prominent, placed near to the anterior margin; ligament rather long and narrow; epidermis fuscous, wrinkled; cardinal teeth compressed, double in the left valve and single in the right; lateral teeth long, curved and somewhat lamellar; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks wide and shallow; nacre dull purple.

Remarks.—I owe to the kindness of Dr Blanding the specimens of this species which are in my cabinet. They were procured by this naturalist while in St Augustine, from an Indian whom he had directed to collect for him, and it is presumed they came from St John's river or some of its tributaries. This species has somewhat the characters of the *obesus* (nobis), and the *complanatus* (Solander). It is not so much inflated as the former, and is more so than the latter. My oldest specimen is subemarginate on the basal margin. In all those procured by Dr Blanding, the beaks were much eroded.

UNIO CAMELUS. Plate XV. fig. 45.

Testâ subtriangulari, inæquilaterali, complanatâ per umbones a natibus usque ad marginem inferiorem; valvulis crassis; radiis sparsis capillaribusque; dente cardinali parvo, laterali magno, crasso, curvato; margaritâ albâ.

Shell subtriangular, inequilateral, flattened over the umbones from the beaks to the basal margin; valves thick; rays scattered and capillary; cardinal teeth small; lateral teeth large, thick and curved; nacre white.

Hab. Ohio river. T. G. Lea.
My Cabinet.

Diam. 1·4, Length 2·3, Breadth 3·4 inches.

Shell subtriangular, inequilateral, angular behind, flattened over the umbones from the beaks to the basal margin; substance of the shell thick; ligament thick; epidermis yellow brown, with capillary rays; cardinal teeth small; lateral teeth very large, thick and curved; anterior and posterior cicatrices both distinct; dorsal cicatrices situated on the inferior part of the cardinal teeth; cavity of the shell shallow, welted; cavity of the beaks very shallow.

Remarks.—This species seems to possess partly the characters of the *gibbosus* (Barnes), and partly those of the *planulatus* (nobis). It may be distinguished from them by its high dorsal margin, its very remarkably thick lateral tooth and its capillary rays.

UNIO GRIFFITHIANUS. Plate XV. fig. 46.

Testâ ellipticâ, expansâ, transversâ, inæquilaterali, lateribus subplanulatis; clivo umboniali rotundato; valvulis subcrassis; natibus parvis; epidermide luteolâ viridi-radiatâ; dente cardinali parvo et lobis instructo; laterali longo, curvo et ad terminum posteriorem aucto; margaritâ purpureâ, albâ, vel salmonis colore tinctâ.

Shell elliptical, spread out, transverse, inequilateral, somewhat flattened on the sides; umbonial slope rounded; valves somewhat thick; beaks small; epidermis yellowish, with green rays; cardinal teeth small, lobed; lateral teeth long, curved and enlarged at posterior end; nacre purple, salmon or white.

Hab. South Carolina. Professor Ravenel.
My Cabinet.
Cabinet of Professor Ravenel, Charleston, South Carolina.

Diam. ·6, Length 1·2, Breadth 2·2 inches.

Shell elliptical, spread out, transverse, inequilateral; somewhat flattened on the sides, rounded on the umbonial slope; substance of the shell somewhat thick; beaks small, scarcely elevated; ligament somewhat long and narrow; epidermis yellowish, with green diverging rays; cardinal teeth small, lobed, disposed to be double in both valves; lateral teeth long, curved and enlarged at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated across the cavity of the beaks; cavity of the beaks rather shallow; cavity of the shell shallow; nacre purple, salmon or white.

Remarks.—Although this shell is very like the *complanatus* (Soland.), I have thought it sufficiently distinct to separate it. It is more rounded before, and more spread out, forming a more perfect ellipsis. In the nacre it is very much the same. I name it after my friend R. E. Griffith, M.D.

UNIO CONFERTUS. Plate XVI. fig. 47.

Testâ trapezoideâ, transversâ, inæquilaterali, inflatâ; valvulis subcrassis; natibus prominulis et transversim rugatis; dentibus cardinalibus compressis, et in *valvulâ utrâque duplicibus; lateralibus longis curvisque; margaritâ purpureâ, aut salmonis colore tinctâ.*

Shell trapezoidal, transverse, inequilateral, inflated; valves rather thick; beaks slightly elevated and transversely wrinkled; cardinal teeth compressed and double in both valves; lateral teeth long and curved; nacre purple or salmon.

Hab. Santee Canal, South Carolina. Professor Ravenel.
My Cabinet.
Cabinet of Professor Ravenel.

Diam. 1·1, Length 1·3, Breadth 2·4 inches.

Shell trapezoidal, transverse, inequilateral, inflated; substance of the shell rather thick; beaks slightly elevated, incurved, transversely wrinkled; umbones very much swollen; ligament rather short and thin; epidermis dark brown, shining; cardinal teeth very much compressed; lateral teeth long and slightly curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices on the superior part of the cavity of the beaks; cavity of the shell very deep; cavity of the beaks full and rounded; nacre purple or salmon.

Remarks.—The *confertus*, in its general characters, resembles the *complanatus* (Solander). It is, however, much more inflated, and differs in having teeth more compressed. The specimens in my cabinet I owe to the kindness of professor Ravenel. These are all without rays. In young specimens they may exist.

SYMPHYNOTA BENEDICTENSIS. Plate XVI. fig. 48.

Testâ trapezio simili, inæquilaterâ, transversâ, subcompressâ, margine dorsali subrectâ; valvulis pertenuibus; natibus subprominentibus, apicibus granulatis; cicatricibus vix cernendis; margaritâ cœruleo-albâ et iridescente.

Shell trapezoidal, inequilateral, transverse, rather compressed, nearly straight on the dorsal margin; valves very thin; beaks somewhat prominent, and granulate at tip; cicatrices scarcely perceptible; nacre bluish white and iridescent.

Hab. Lake Champlain.

My Cabinet.
Cabinet of Professor Benedict, Burlington, Vermont.
Diam. 1·4, Length 2·2, Breadth 3·6 inches.

Shell trapezoidal, inequilateral, transverse, rather compressed, nearly straight on the dorsal margin; substance of the shell very thin; epidermis shining, yellowish olive, with rather strong lines of growth; beaks somewhat prominent and granulate at tip; cicatrices scarcely perceptible; cavity of the beaks shallow; cavity of the disk rather shallow; nacre bluish white and iridescent.

Remarks.—On my way to Quebec, in the summer of 1829, I spent a few minutes on the shore of lake Champlain, nearly opposite to fort Ticonderoga, waiting for the steamboat. These minutes were improved in the search of the shells near the edge of the water. Among others hastily seized, was a single individual of the present species, which, though an alive specimen, was much decorticated. Unwilling to describe it as a new species, without better individuals for examination, I have endeavoured in vain to procure them until the present time. I owe to the kindness of professor Benedict a suite of different ages which verify my previous impression, and to him I dedicate the species. In outline (except the wings) it resembles the *Symphynota bi-alata* (nobis). It is not, however, so large or so thick a shell, and has neither tooth nor undulations.

ANODONTA BURROUGHIANA. Plate XVI. fig. 49.

Testâ ovatâ, valde inæquilaterali, subinflatâ; valvulis tenuibus; natibus prominulis; lineâ dorsali curvâ; margaritâ purpureâ.

Shell ovate, very inequilateral, slightly inflated; valves thin; beaks slightly elevated; dorsal line curved; nacre purple.

Hab. Island of Luconia, near Manilla. Dr Burrough.
My Cabinet.
Cabinet of Dr Burrough.

Diam. ·8, Length 1·3, Breadth 2·1 inches.

Shell reversely ovate, very inequilateral, slightly inflated, rather straight on the basal margin and elevated on the posterior dorsal margin; substance of the shell thin; beaks slightly elevated; ligament long and narrow; epidermis dark brown and rather smooth; anterior and posterior cicatrices confluent; dorsal cicatrices situated in the cavity of the beaks; cavity of the shell wide and rather deep; cavity of the beaks very shallow; nacre purple.

Remarks.—To the kindness of Dr Burrough I am indebted for the privilege of describing this species. It is with pleasure I take the opportunity of placing his name upon it. It was procured by him near the city of Manilla. It resembles, in outline and colour, the *Unio cuprinus* (nobis), but has no trace of teeth. It is most remarkable perhaps for its deep colour.

MARGARITANA* RAVENELIANA. Plate XVII. fig. 50.

Testâ subcylindraceâ, valde transversâ et inæquilaterali, inflatâ; valvulis tenuibus; natibus exiguis; dentibus cardinalibus parvis, subcompressis; margaritâ cœruleo-albâ.

Shell subcylindrical, very transverse, inequilateral, inflated; valves thin; beaks small; cardinal teeth small, rather compressed; nacre bluish white.

Hab. French Broad and Swananoe rivers, North Carolina.

My Cabinet.

Cabinet of Dr Ravenel.

Diam. ·9, Length 1·1, Breadth 2·2 inches.

Shell subcylindrical, very transverse, inequilateral, inflated, disposed to be compressed near the basal margin, where it is often emarginate; substance of the shell thin; beaks small; ligament rather short; epidermis brown, with rays on the posterior part; umbonial slope large, rounded; cardinal teeth consisting in each valve of a small compressed lobe; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices placed under the cardinal teeth; cavity of the shell deep; cavity of the beaks shallow; nacre bluish white.

---

* See note, ante page 43.

Remarks.—This species most resembles the *Alasmodonta marginata* (Say), but may be distinguished by its more cylindrical form, and its want of undulations on the posterior slope. It differs also in the roundness of the umbonial slope, and in the rays. In the *marginata* the rays are more interrupted and scattered, being sometimes quite spotted.

CYRENA ROTUNDATA. Plate XVII. fig. 51.

Testâ rotundatâ, sublenticulari, subæquilaterali, transversim rugatâ; clivo posteriori rugoso; valvulis crassis; natibus parvis, acutis, contiguis; dentibus cardinalibus subbifidis, lateralibus longis, minute serratis, rectisque; margaritâ albâ et purpureâ.

Shell round, sublenticular, nearly equilateral, transversely wrinkled, rugose on the posterior slope; valves thick; beaks small, pointed, touching; cardinal teeth disposed to be bifid; lateral teeth long, straight and minutely serrulate; nacre white and pinkish.

Hab. . . . .

My Cabinet.

Diam. 1·5, Length 2·9, Breadth 3·3 inches.

Shell round, sublenticular, nearly equilateral, transversely and rather minutely wrinkled, rugose on the posterior slope; substance of the shell thick; beaks small, pointed, touching; ligament very short and thick; epidermis yellowish brown before and dark brown behind; anterior slope furnished with a lanceolate mark formed by two curved yellow lines, which pass from the beaks to the anterior margin; posterior slope rugose, furnished with obsolete oblique folds; cardinal teeth disposed to be bifid; lateral teeth long, straight and very minutely serrulate; cicatrices scarcely perceptible; cavity of the shell rather shallow; cavity of the beaks subangular; nacre white and pinkish.

Remarks.—This beautiful and fine large species was sent to me some years since by a dealer in Paris. It perhaps most resembles the *Zeylanica* (Lamarck). It differs, however, in being more compressed, more rotund, in having longer lateral teeth, and in these being serrulate. The nacre is rather thinner, and is coloured. On comparison it will be observed that the anterior tooth of the *Zeylanica* is merely a tubercle, while that of *rotundata* is long and lamellar. The nacre is disposed to be pinkish on the posterior part.

CYRENA JAYENSIS. Plate XVII. fig. 52.

Testâ subrotundâ, subæquilaterali, antice rugosâ; valvulis crassis; natibus parvis, elevatis; dentibus cardinalibus bifidis, lateralibus longis, minute serratis, rectisque; margaritâ purpureâ.

Shell subrotund, nearly equilateral, transversely wrinkled on the anterior part; valves rather thick; beaks small, elevated; cardinal teeth bifid; lateral teeth long, nearly straight, and minutely serrulate; nacre purple.

Hab. Batavia? J. C. Jay, M.D.
My Cabinet.
Cabinet of Dr Jay.

Diam. 1·1, Length 2·2, Breadth 2·3 inches.

Shell subrotund, nearly equilateral, furnished with transverse rather large wrinkles on the anterior part; substance of the shell rather thick; beaks small, elevated, retuse; ligament very short and thick; epidermis dark brown, shining; cardinal teeth bifid, long, nearly straight and minutely serrulate; cicatrices scarcely perceptible; cavity of the shell shallow; cavity of the beaks subangular; nacre dark purple, sometimes whitish.

Remarks.—It is to the kindness of Dr Jay I am indebted for the specimen figured. That of his cabinet is rather more oblique than this. The *Jayensis* has some resemblance to the *rotundata*, described herein, but differs in having rather large wrinkles on the anterior part, in having more elevated beaks, and in the dark purple colour of the nacre.

CYRENA TURGIDA. Plate XVIII. fig. 53.

Testâ trigonâ, inflatâ, parte anticâ turgidâ, rugosâ, inæquilaterâ, transversim rugatâ; valvulis crassis; natibus elevatis, recurvis; dentibus cardinalibus sub-bifidis, dente anteriore laterali brevi et elevato, posteriore longo et laminato; margaritâ albâ.

Shell triangular, inflated, swollen on the anterior part, rugose, inequilateral, transversely wrinkled; valves thick; beaks elevated, recurved; cardinal teeth disposed to be bifid; anterior lateral tooth short and elevated; posterior lateral tooth long and lamellar; nacre white.

Hab. . . . . , India. Rev. William Carey.
My Cabinet.

Diam. 1·2, Length 1·7, Breadth 2·1 inches.

Shell triangular, inflated, swollen on the anterior part, rugose, inequilateral, transversely wrinkled; substance of the shell thick; beaks elevated, recurved; ligament rather long and narrow; epidermis yellowish brown, darker towards the margin; cardinal teeth disposed to be bifid; anterior lateral tooth short and elevated, somewhat conical; posterior lateral tooth long and lamellar; cicatrices scarcely perceptible; cavity of the shell deep and rounded; cavity of the beaks angular; nacre white.

Remarks.—To the kindness of Dr Carey of Calcutta I owe several specimens of this species. In the teeth it resembles the *C. Zeylanica* (Lamarck), and the *C. papua* (Lesson). It differs from both in being more triangular, more inflated, as well as in being a smaller species. In the enlargement of the anterior part, which seems to be turgid or swollen, it differs from any *Cyrena* with which I am acquainted. Being without serrulate teeth, it belongs to Lamarck's second division—" dents latérales entières.

CYRENA WOODIANA. Plate XVIII. fig. 55.

Testâ subtrigonâ, subinflatâ, micante, subæquilaterali, transversim rugatâ; valvulis crassis; natibus magnis et rotundatis; dentibus cardinalibus sub-bifidis, lateralibus longis, serratis, rectisque; margaritâ albâ.

Shell subtriangular, somewhat inflated, shining, nearly equilateral, transversely wrinkled; valves thick; beaks large and rounded; cardinal teeth disposed to be bifid; lateral teeth long, straight, serrulate; nacre white.

Hab. Canton. W. W. Wood.
My Cabinet.

Diam. 1·4, Length 2·4, Breadth 2·9 inches.

Shell subtriangular, obtusely angular behind, somewhat inflated, shining, nearly equilateral, transversely and rather largely wrinkled; substance of the shell thick; beaks large, rounded, not very approximate; ligament rather short and thick; epidermis blackish brown, polished, except on posterior slope; wrinkles larger near to the margin; cardinal teeth disposed to be bifid; lateral teeth long, straight, serrulate; cicatrices scarcely perceptible; cavity of the shell deep; cavity of the beaks angular; nacre white.

Remarks.—In the intenseness of colour of the epidermis, and its high polish, this species differs from any I am acquainted with. It is more inflated and less rotund than the *rotundata* herein described. Its lateral teeth are longer and not so minutely serrulate. In its triangular form it resembles the *C. papua* (Lesson). The nacre has not the clear white usual in this genus. In this specimen, below the palleal impression, it is yellowish white.

Mr Wood, to whose great kindness I owe this fine and interesting species, informed me he procured it from a boat on the river below Canton, it having been fished up by accident, when the fishermen were engaged in catching other shell fish. Owing the possession of it to him, I with great pleasure dedicate it to him.

GENUS APHRODITE (nobis).

Testâ æquivalvi, subtrigonâ, inæquilaterali; dente cardinali subnullo; dentibus lateralibus binis, sublongis; ligamento externo.

Shell equivalve, subtriangular, inequilateral; hinge with a very imperfect or no cardinal tooth; lateral teeth two, rather long; ligament external.

Remarks.—The genus *Aphrodite* is proposed for a single species which I am unable to place with any established genus. I suspect it to be an estuary shell, and should it prove so, its proper place will be after the genus *Cyrena.* The lateral teeth are placed somewhat like those in that genus, but the epidermis and substance of the shell differ entirely, being more like the genus *Mactra.*

A. COLUMBA. Plate XVIII. fig. 54.

Testâ subcompressâ, longitudinaliter et obsolete striatâ, transversim et minute rugatâ, colore columbæ tinctâ, super umbones subrufis maculis ungulatis munitâ; valvulis tenuibus; natibus elevatis, acutis; dentibus cardinalibus obsoletis, lateralibus binis; margaritâ luteo-albâ.

Shell rather compressed, longitudinally and obsoletely striate, transversely and minutely wrinkled, dove coloured, on the umbones furnished with reddish angular marks; valves thin; beaks elevated, pointed; cardinal teeth obsolete; lateral teeth two; nacre yellowish white.

Hab. . . . .

My Cabinet.

Diam. 1·4, Length 2·9, Breadth 3·4 inches.

Shell subtriangular, nearly equilateral, rather compressed, longitudinally and obsoletely striate, transversely and minutely wrinkled, dove coloured, furnished on the umbones with reddish angular marks; substance of the shell thin and fragile; beaks elevated, pointed, touching; ligament short and thick; epidermis thin; cardinal teeth obsolete or wanting; lateral teeth two, rather long, straight, and disposed to be lamellar; cicatrices smooth, impressed, showing the mark of their advancement; palleal impression indistinct, broad; cavity of the shell rather shallow; cavity of the beaks angular; nacre yellowish white and shining.

Remarks.—This is certainly a very interesting shell. It is difficult to find any one to compare it with. On the inside of the anterior margin there appears to be a disposition to crenulation, caused by the longitudinal striæ. Its habitat I am not acquainted with, having purchased my specimens at a dealer's in Europe, who could not inform me from what country they came.

Io spinosa. Plate XIX. fig. 79.

Testâ obtuse turritâ, latâ, corneâ, sub epidermide fasciatâ, spinis magnis; anfractibus septenis; aperturâ elongatâ, dimidium longitudinis testæ habente.

Shell obtusely turrited, wide, horn colour, under the epidermis banded, furnished with large spines; whorls seven; mouth elongate, one half the length of the shell.

Hab. Holston River, Washington County, Virginia. Professor Troost.

My Cabinet.
Cabinet of Professor Troost.

Diam. 1·2, Length 2·2 inches.

Remarks.—This species resembles very much the *Io fusiformis* (nobis), *Fusus fluviatilis* (Say), but may be distinguished by its large transversely compressed spines, the *fusiformis* having somewhat longitudinal tubercles. I am not acquainted with any fluviatile shell which has such large spines (there being about seven on each whorl), nor any which has such a general resemblance to a marine shell. Professor Troost informs me they are rare in the river, that they had been observed in the graves of the aborigines; and as it was generally believed that these were "conch shells," consequently coming from the sea, it was urged that the inhabitants who possessed them must have come over the sea. It does not appear that they had been observed in their native element, though living at the very doors of the persons who had remarked them in the tumuli.

PALUDINA BURROUGHIANA. Plate XIX. fig. 80.

Testâ turritâ, tenebroso-corneâ, transversim striatâ, striis majoribus duabus vel tribus circiter medium anfractum; suturis profundis; anfractibus senis, valde convexis; aperturâ rotundatâ, albâ.

Shell turrited, dark horn colour, transversely striated, having two or three large striæ about the middle of the whorl; sutures very deep; whorls six, very convex; mouth round, white.

Hab. Island of Luconia. Dr Burrough.
My Cabinet.
Cabinet of Dr Burrough.
Cabinet of the Academy of Natural Sciences of Philadelphia.
Diam. 1·2, Length 1·8 inches.
Operculum thin, light brown.

Remarks.—This is perhaps the largest species of *Paludina* which has yet been observed. It is remarkable for the numerous fine transverse striæ which are subgranose or undulated, and which cover, in some specimens, the whole of the whorls. About the middle of the whorls there are several larger striæ, the largest being always, in the specimens examined by me, immediately above the suture. I owe to Dr Burrough's great kindness the opportunity of describing this species. During his late voyage he procured it, with many other fine shells, from the vicinity of Manilla, in the island of Luconia.

Read before the American Philosophical Society, April 18th, 1834.

LYMNÆA ACUTA. Plate XIX. fig. 81.

Testâ elongato-turritâ, tenui, lævi, fusco-nigricante; spirâ attenuatâ; anfractibus senis; aperturâ subovatâ.

Shell elevated, turrited, thin, smooth, dark brown; spire attenuate; whorls six; aperture subovate.

Hab. pond four miles north of Philadelphia.
Diam. ·3, Length ·7 of an inch.

Remarks.—This delicate species, although attenuate, is not so much so as the *exilis* herein described. Its whorls are more convex and the body whorl larger, the aperture being about one half the length of the shell. Several specimens were found by me some years since, in a very small pond near to the Falls of Schuylkill. Since then this pond has occasionally dried up, and I have not been able to find others. Although there are other ponds near to this, which other species inhabit, I have never been able to discover the *acuta* in any other spot.

LYMNÆA EXILIS. Plate XIX. fig. 82.

Testâ attenuatâ, tenuissimâ, longitudinaliter striatâ; anfractibus septenis, plano-convexis; columellâ reflexâ; aperturâ ovato-oblongâ.

Shell attenuated, very thin, longitudinally striate; whorls seven, plano-convex; columella reflected; aperture ovato-oblong.

Hab. Ohio, T. G. Lea.
My Cabinet.
Diam. ·4, Length 1·5 inches.

Remarks.—This is perhaps the most attenuated Lymnæa yet observed in this country. It approaches most to the *reflexus* (Say), but is more elongate than that species. The most remarkable character of the *exilis* is, perhaps, the reflection of its labium, which is not laid on the body of the whorl. Where it joins above with the labrum, the angle is quite acute, and is separated from the body whorl. The specimen figured was not taken alive, and the epidermis being destroyed, the description and representation are partially defective. The aperture is about two-fifths the length of the shell.

PHYSA ELLIPTICA. Plate XIX. fig. 83.

Testâ sinistrosâ, ellipticâ, tenuissimâ, pellucidâ, castaneâ, nitidâ; spirâ breviusculâ; anfractibus quaternis; labro marginato; aperturâ angustatâ.

Shell sinister, elliptical, very thin, pellucid, chesnut coloured, shining; spire rather short; whorls four; outer lip margined; aperture narrow.

Hab. . . . . T. G. Lea.

My Cabinet.

Diam. ·2, Length ·5 of an inch

Remarks.—This species is less inflated and more of a chestnut colour than any I am acquainted with. Its colour is almost reddish, and the light coloured margin of the outer lip is remarkable. The aperture is rather contracted, and the whole shell somewhat elongate.

AMPULLARIA HOPETONENSIS. Plate XIX. fig. 84.

Testâ subventricosâ, lævi, superne subplanulatâ, perforatâ, luteo-fuscescente, fasciatâ; suturis impressis; anfractibus quinis; aperturâ subovatâ, albâ.

Shell subventricose, smooth, flattened above, umbilicate, yellowish-brown, banded; sutures impressed; whorls five; aperture subovate, white.

Hab. Hopeton, near Darien, Georgia. Professor Shepard.
My Cabinet.
Cabinet of Professor Shepard.
Diam. 1·4, Length 1·7 inches.

Remarks.—I owe to the kindness of professor Shepard of New Haven this interesting shell. It was procured by him during his late geological investigations in our southern states, with other shells, descriptions of which will be found in these memoirs. It resembles the *A. fasciata* (Lam.), but is less globose, the whorls of our species being somewhat flattened on the side and top. It differs from the *A. depressa* (Say), described in major Long's expedition to St Peter's river (subsequently changed to *A. paludosa* in the Disseminator), in being less globose, and in being flatter on the side and superior part of the whorls.

PALUDINA GEORGIANA. Plate XIX. fig. 85.

Testâ ventricoso-conoideâ, tenui, tenebroso-corneâ, lævi; suturis valde impressis; anfractibus instar quinis, convexis; aperturâ subrotundatâ, albâ.

Shell ventricoso-conical, thin, dark horn coloured, smooth; sutures very much impressed; whorls about five, convex; aperture nearly round, white.

Hab. Hopeton, near Darien, Georgia. Professor Shepard.
My Cabinet.
Cabinet of Professor Shepard.
Diam. ·7, Length 1·1 inches.

Remarks.—This species, in form, resembles most, perhaps, the *P. vivipara*. It is not quite so large, nor has it bands. It is rather more elevated, and the body whorl is smaller and rounder than the *P. decisa* (Say). The aperture at the base recedes more than is usual with this genus.

Succinea retusa. Plate XIX. fig. 86.

Testâ ovato-oblongâ, tenuissimâ, pellucidâ, flavidulâ; spirâ brevi; anfractibus ternis; aperturâ inferne dilatatâ et retractâ.

Shell ovately oblong, very thin, pellucid, yellowish; spire short; whorls three; aperture below dilate and drawn back.

Hab. Ohio, near Cincinnati. T. G. Lea.
Diam. ·3, Length ·7 of an inch.

Remarks.—A single specimen only of this species has come into my possession. It differs so much from any of the described species, in the dilatation and retraction of the inferior part of the aperture, that I have not hesitated to consider it new.

SYSTEMATIC INDEX.

Unio acutissimus page 99
anodontoides 91
angustatus 124
arcæformis 126
asper 95
asperrimus 81
ater 40
Blandingianus 213
brevidens 85
Burroughianus 179
calceolus 7
camelus 214
capillaris 141
capsæformis 143
castaneus 101
circulus 47
cœruleus 105
Congaræus 82
confertus 215
Conradicus 175
Cooperianus 173
Corrianus 177
cuprinus 104
decisus 102
divaricatus 176
donaciformis 9
dromas 182
ebenus 94
elegans 93
ellipsis 10
emarginatus 174
fabalis 96

Unio formosus page 121
fulvus 208
geometricus 150
glans 92
Grayanus 178
Griffithianus 215
Haysianus 147
heterodon 42
Hildrethianus 148
incurvus 107
iris 53
irroratus 11
Kirtlandianus 210
lacteolus 152
lacrymosus 14
lanceolatus 8
lens 90
modioliformis 209
multiplicatus 80
multiradiatus 48
multistriatus 101
Murchisonianus 145
Nashvillianus 212
Nicklinianus 140
obesus 106
occidens 49
olivarius 118
oriens 83
Paranensis 211
parallelopipedon 172
patulus 55
perdix 184

Unio perplexus - - - page 122
  pileus - - - 129
  pictus - - - 185
  planulatus - - - 45
  pustulatus - - - 89
  pustulosus - - - 86
  pyramidatus - - 119
  Ravenelianus - - 144
  rubiginosus - - 41
  Schoolcraftensis - 149
  securis - - - 51
  Shepardianus - - 207
  soleniformis - - 97
  Sowerbianus - - 180
  sulcatus - - - 44
  stapes - - - 87
  subovatus - - - 128
  subglobosus - - 142
  subrotundus - - 127
  Taitianus - - - 151
  trapezoides - - 79
  trigonus - - - 120
  Troostensis - - 183
  varicosus - - - 100
  zig-zag - - - 54
Anodonta Blainvilliana - 189
  Burroughiana - 217
  Ferussaciana - 157
  incerta - - 158
  lato-marginata - 188
  Mortoniana - - 192
  plana - - - 160
  Stewartiana - - 159
  tenebricosa - - 190
Margaritana Raveneliana - 218
Symphynota alata - - 62
  Benedictensis - 216
  bi-alata - - 59
  bi-lineata - - 108
  compressa - 64
  cygnea - - 70
  complanata - 62
  discoidea - - 187
  globosa - - 153
  gracilis - - 66
  inflata - - 109
  lævissima - 58
  magnifica - 155
Symphynota ochracea - - page 69
  tenuissima - 67
  Woodiana - 154
Cyrena Jayensis - - - 220
  rotundata - - 219
  turgida - - - 221
  Woodiana - - 222
Aphrodite columba - - 223
Helix Caroliniensis - - 112
  cincta - - - 168
  cyclostomopsis - - 165
  diaphana - - 166
  globula - - - 170
  Himalana - - - 167
  mamilla - - - 166
  monodonta - - 165
  muscarum - - 163
  ovum-reguli - - 164
  purpuragula - - 163
  vesica - - - 168
  Woodiana - - 169
Carocolla Helicoides - - 113
  spinosa - - 114
Helicina lens - - - 161
  pulcherrima - - 161
  virginea - - 162
Achatina Vanuxemensis - 196
Succinea retusa - - - 229
Auricula fuscagula - - 195
Cyclostoma striata - - 196
Physa elliptica - - - 227
Lymnæa acuta - - - 226
  exilis - - - 226
  imperialis - - 193
Melania aculeus - - 193
  acuta - - - 111
  elongata - - 130
  subularis - - 110
  tuberculata - - 111
Io fusiformis - - - 132
  spinosa - - - 224
Melanopsis maculata - - 194
  princeps - - 194
Paludina bi-monilifera - - 170
  Burroughiana - 225
  Georgiana - - 228
Ampullaria Hopetonensis - 227

ERRATA.

Page 20, *line* 4 *from the bottom, for* peruvianus *read* plicatus.
Page 31, *lines* 4 *and* 5 *from the bottom, for* peruvianus *read* plicatus.
Page 32, *line* 4 *from the bottom, for* peruvianus *read* plicatus.
Page 38, *line* 4 *from the bottom, for* made the type of *read* placed in.
Page 77, *in the first note, for* Vol. III. p. 442 *read* ante page 56.
Page 78, *in the note, for* Transactions Vol. III. *read* ante page 31.
Page 83, *in the note, for* Vol. III. p. 416 *read* ante page 30.
Page 84, *line* 5 *from the top, for* divided *read* undivided.
Page 85, *line* 11 *from the top, for* Ohio *read* Cumberland River.
Page 117, *lines* 14 *and* 15 *from the top, for* Vol. III. p. 442 *read* ante page 56.
Page 117, *in the first note, for* Vol. IV. p. 90 *read* ante page 100.
Page 117, *in the second note, for* Vol. III. p. 424 *read* ante page 38.
Page 123, *in the note, for* Vol. III. p. 418 *read* ante page 32.
Page 124, *line* 13 *from the bottom, for* very *read* rays.
Page 127, *in the note, for* Vol. III. p. 431 *read* ante page 45.
Page 137, *line* 12 *from the top, for* this *read* its.
Page 139, *last line, for* Phrygania *read* Phryganea.
Page 160, *line* 4 *from the top, for* palna *read* plana.
Page 176, *line* 8 *from the top, for* Conradius *read* Conradicus.
Page 199, *line* 9 *from the bottom, for* cabinet *read* cabinets.

TO THE READER.

In the third of these Memoirs, references to previous pages have been adapted to the volume and page of the Philosophical Transactions *only.* The subjoined table enables the reader to refer to the corresponding places in these separate Memoirs.

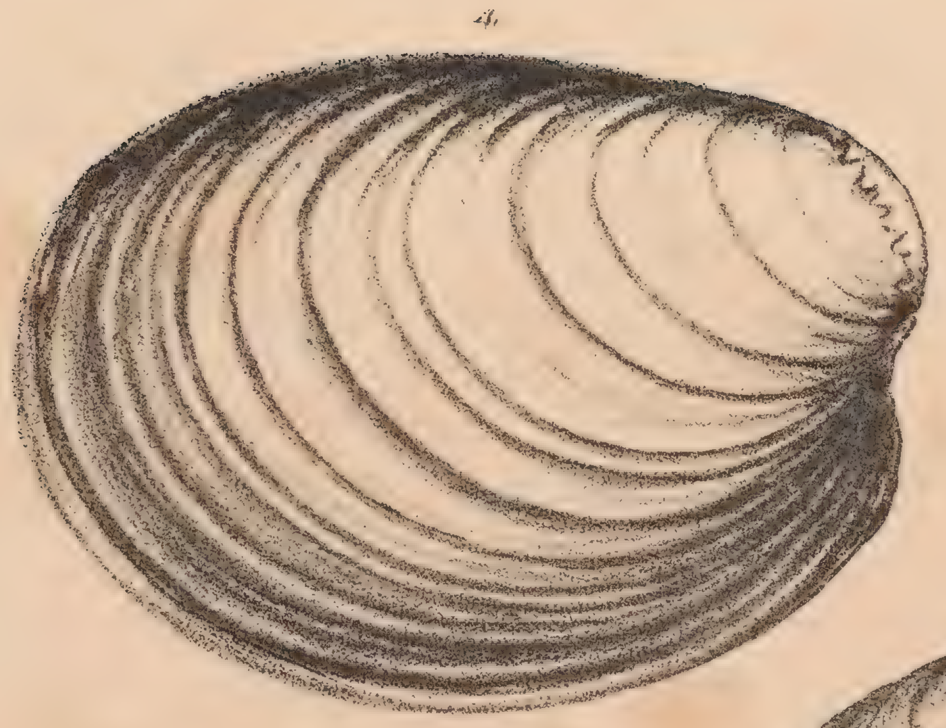
Page 77	Vol. III. p. 442	*corresponds with* ante page 56 *of these Memoirs.*
78	Transactions, Vol. III.	ante page 31
83	Vol. III. p. 416	ante page 30
117	Vol. III. p. 442	ante page 56
117	Vol. IV. p. 90	ante page 100
117	Vol. III. p. 424	ante page 38
123	Vol. III. p. 418	ante page 32
127	Vol. III. p 431	ante page 45

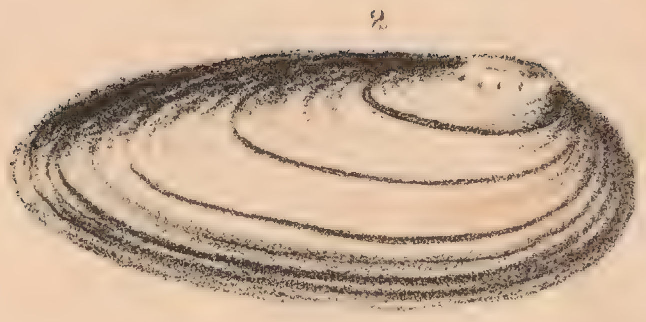
ERRATA.

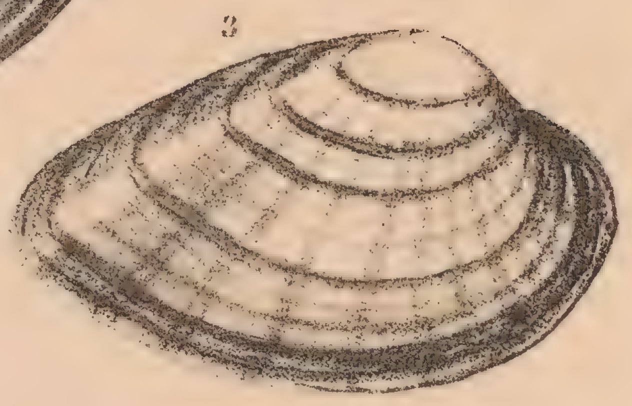
Page 84, 5 *lines from top, for* divided *read* undivided.
Page 85, 11 *lines from top, for* Ohio *read* Tennessee.

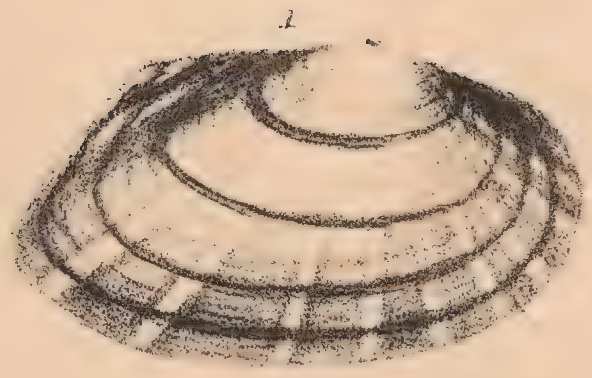
PL. III Vol. 3.

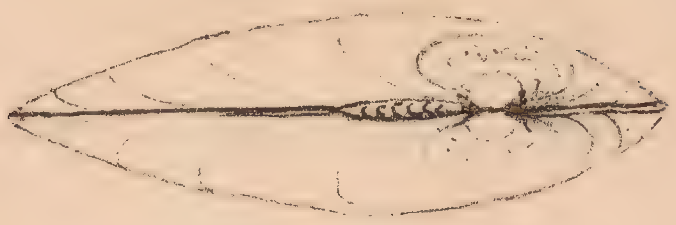
PL. IV Vol. 3.

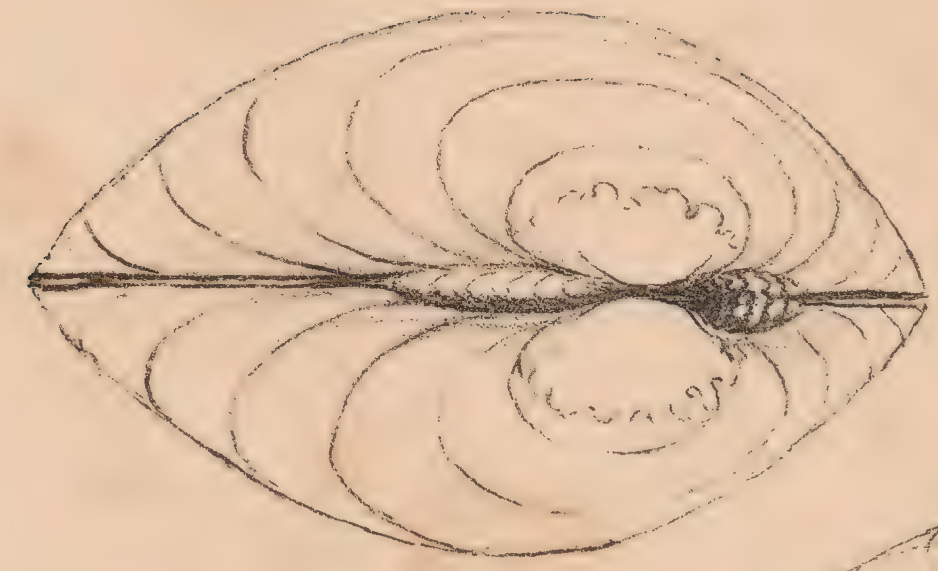


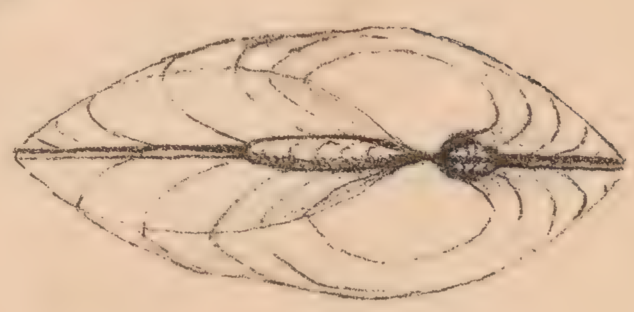


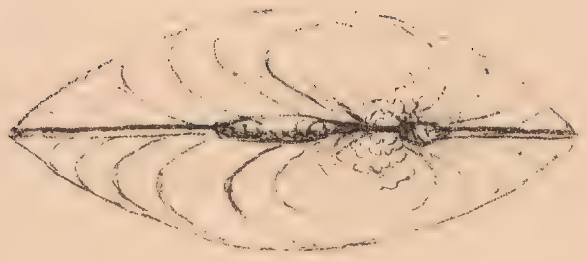


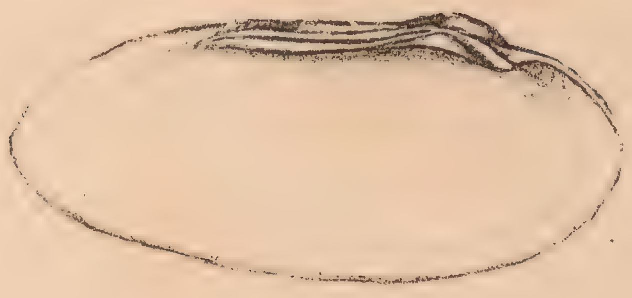




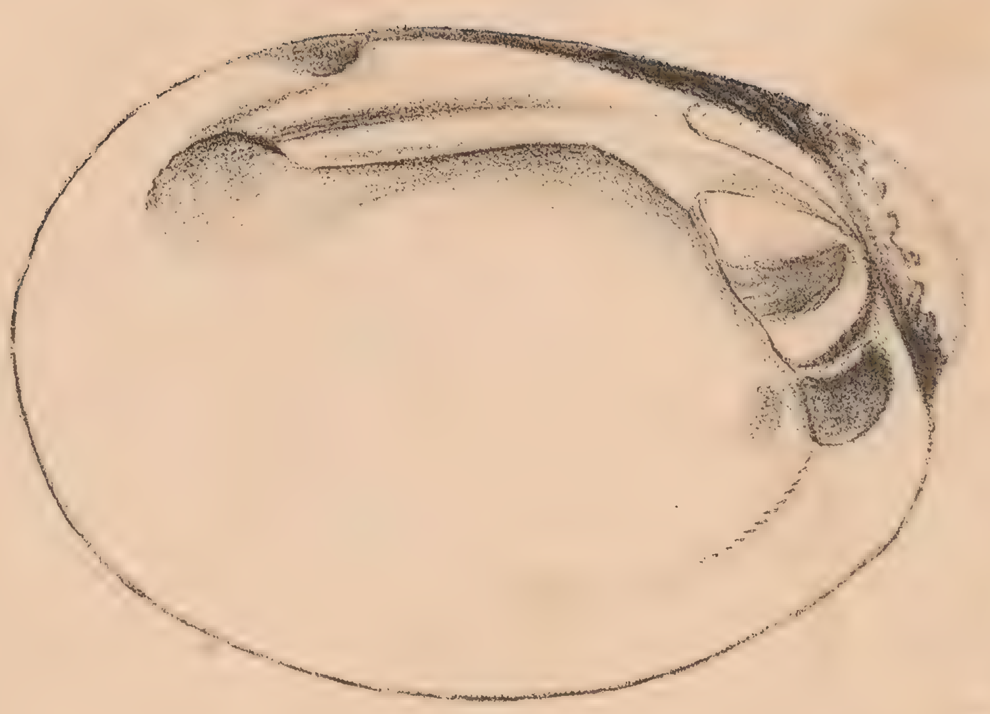




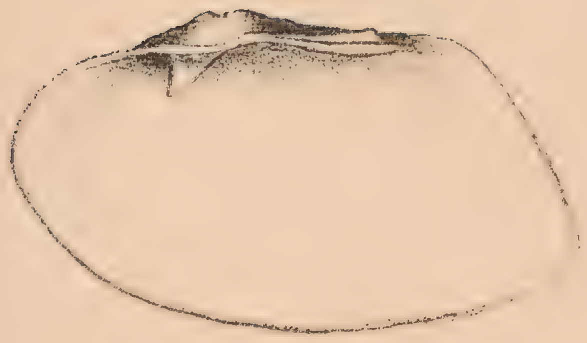




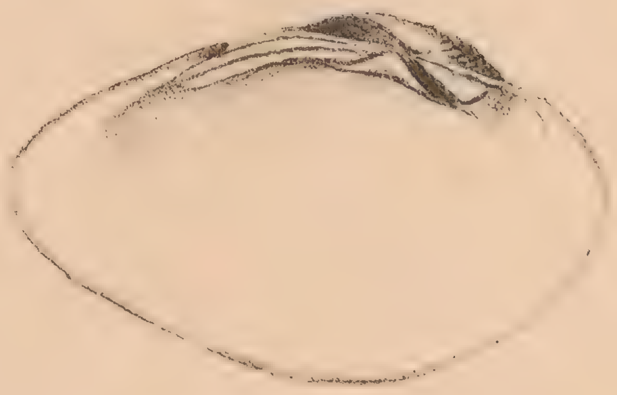
Unio lanceolatus



Unio ellipsis.



Unio calceolus.

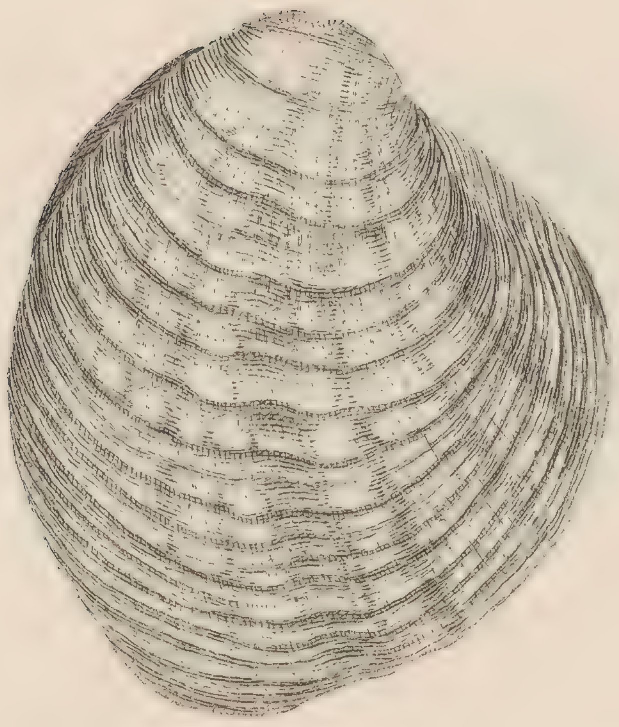


Unio donaciformis.

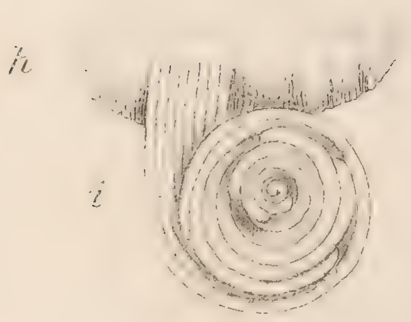
Drawn by I. Lea & on Stone by J. Drayton

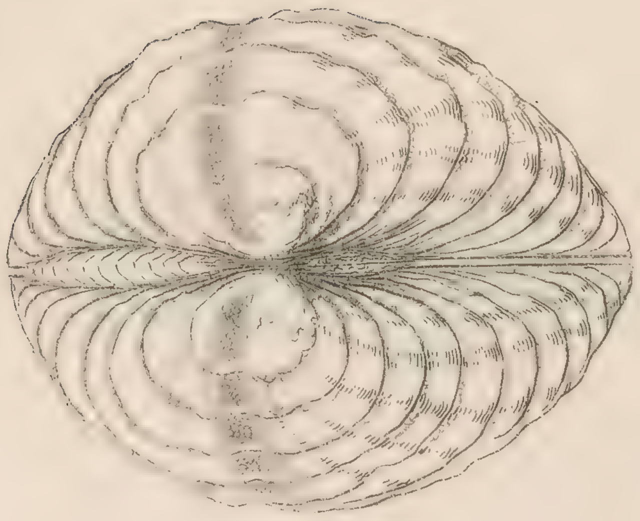
V

5

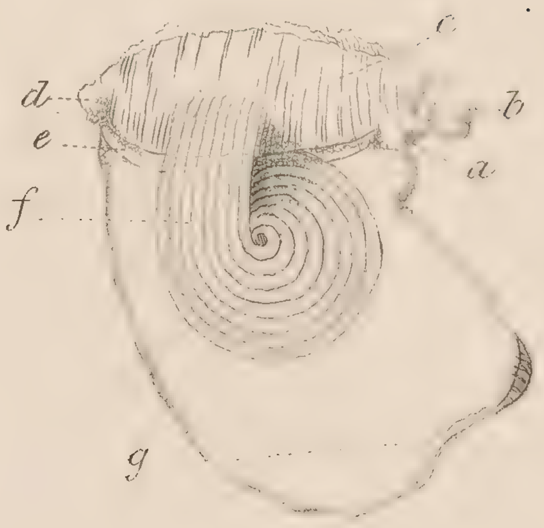


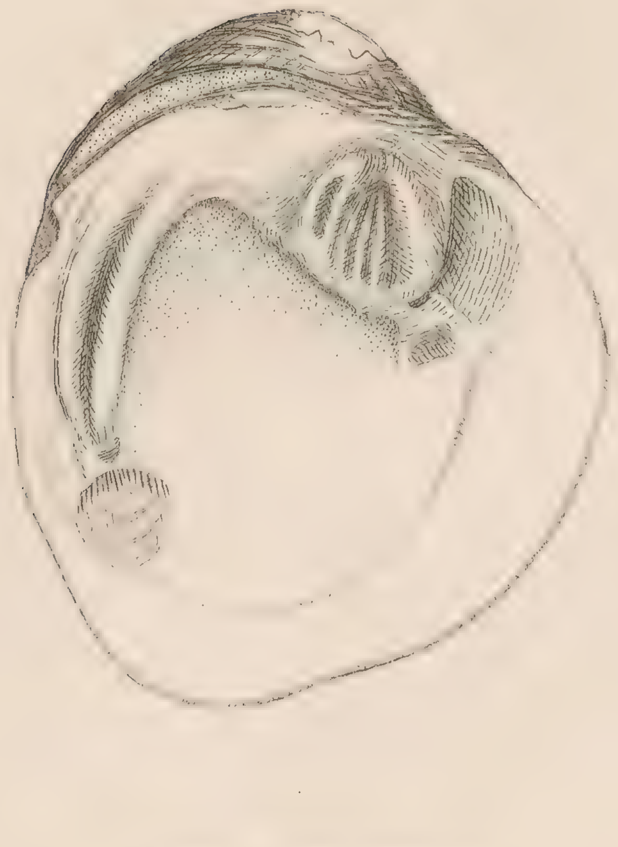
6





7

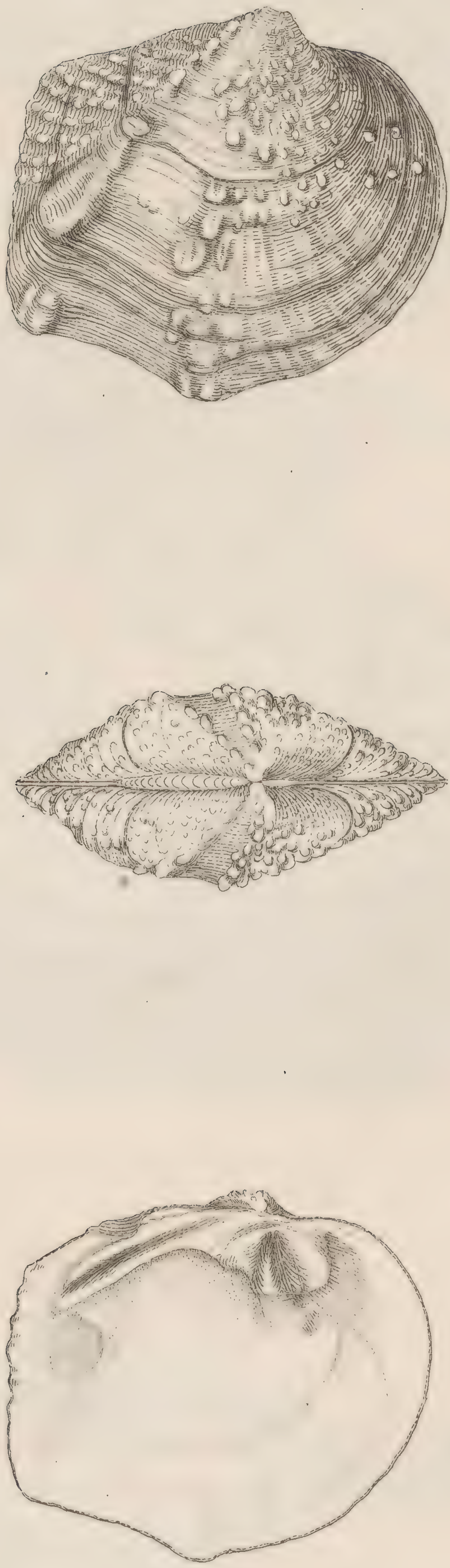




Unio irroratus

Drawn by I.Lea *J. Drayton Aq.f.*

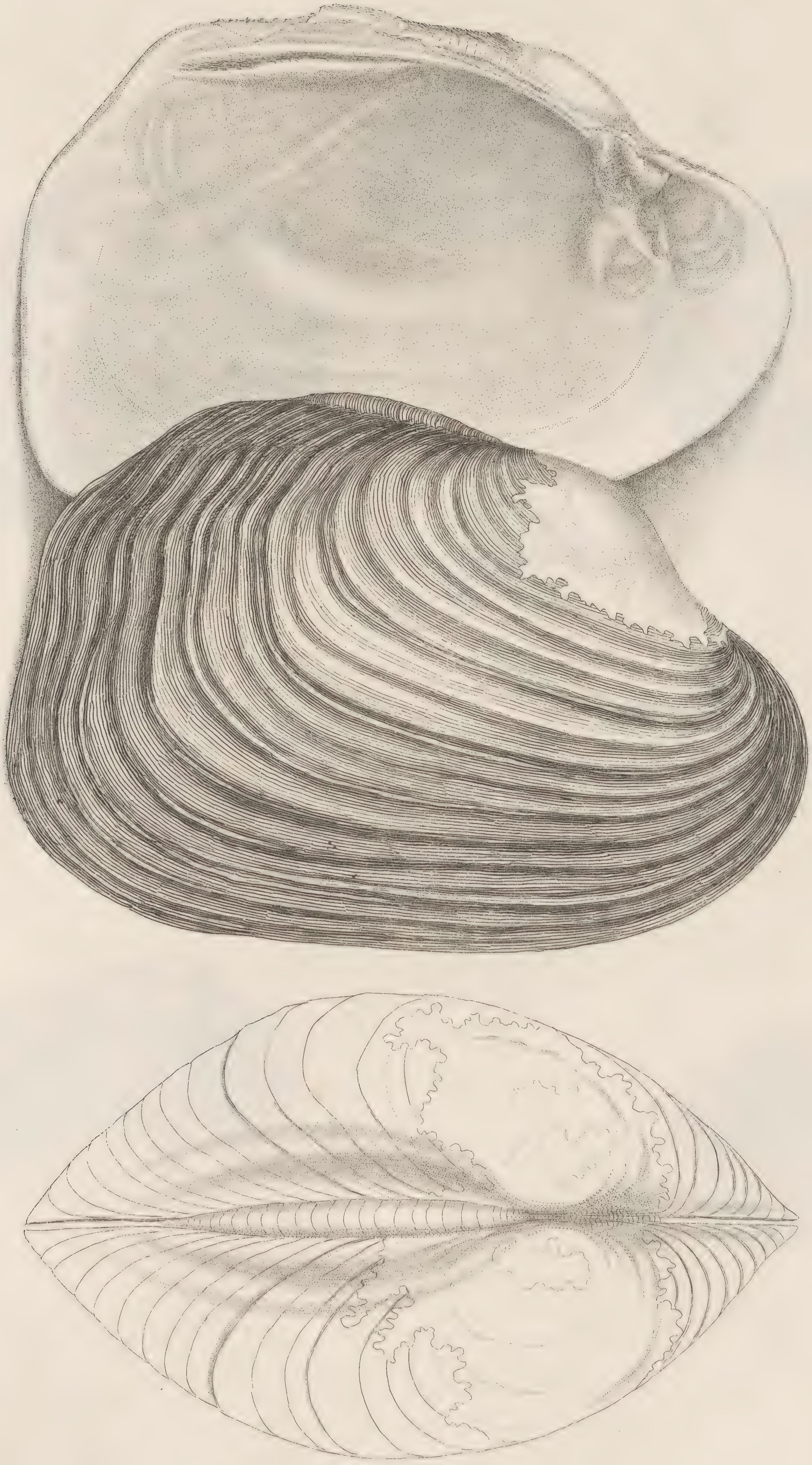
8



Unio lacrymosus.

Drawn by I. Lea. J. Drayton Aqf.

9

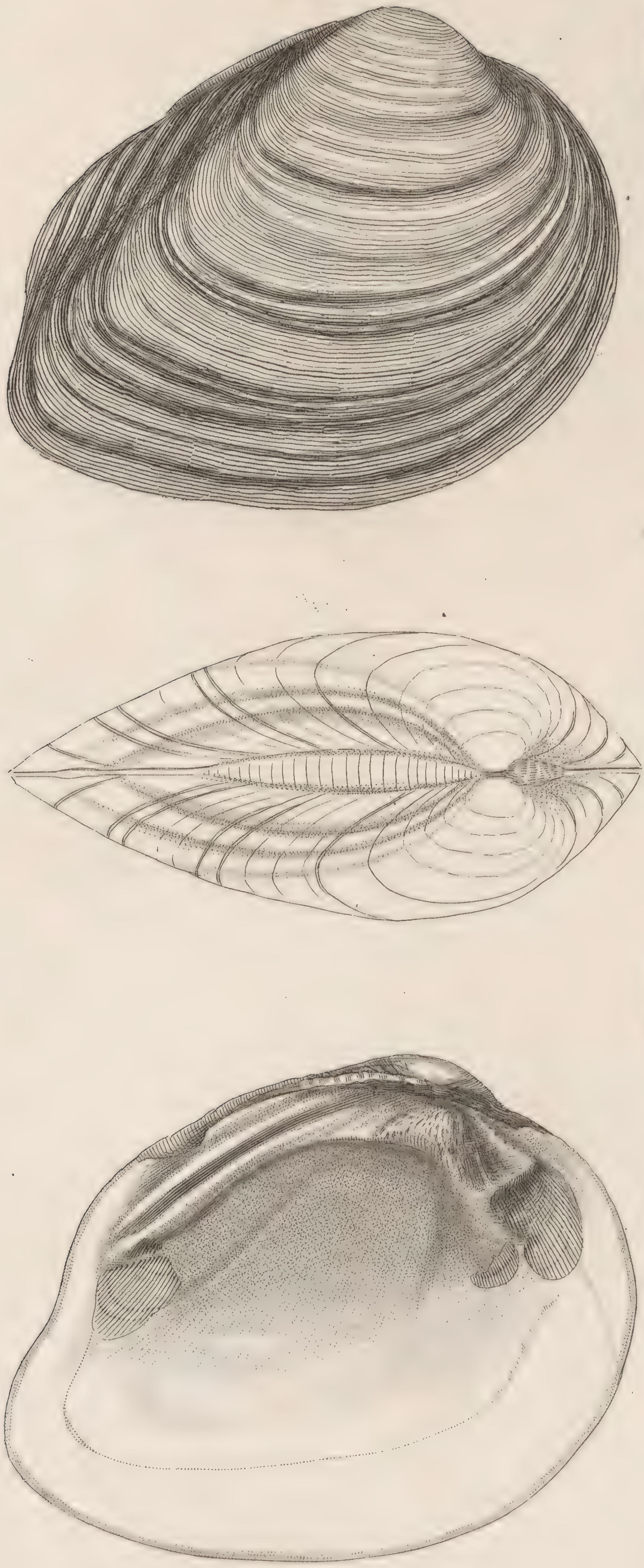


Unio ater

[illegible]

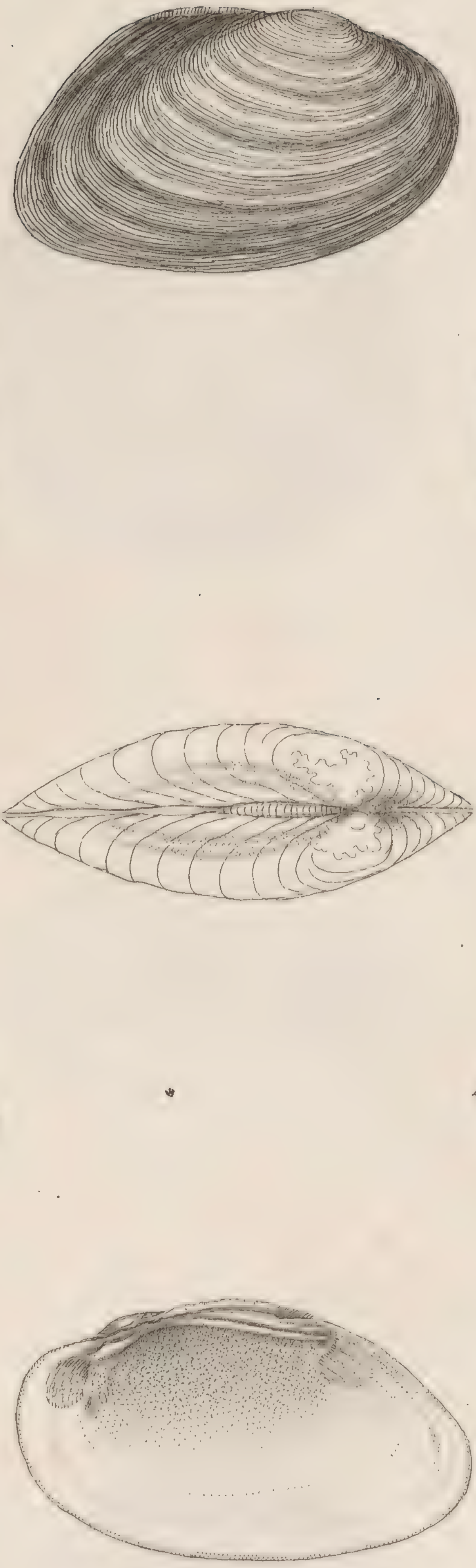
PL. VIII vol. 3.

10



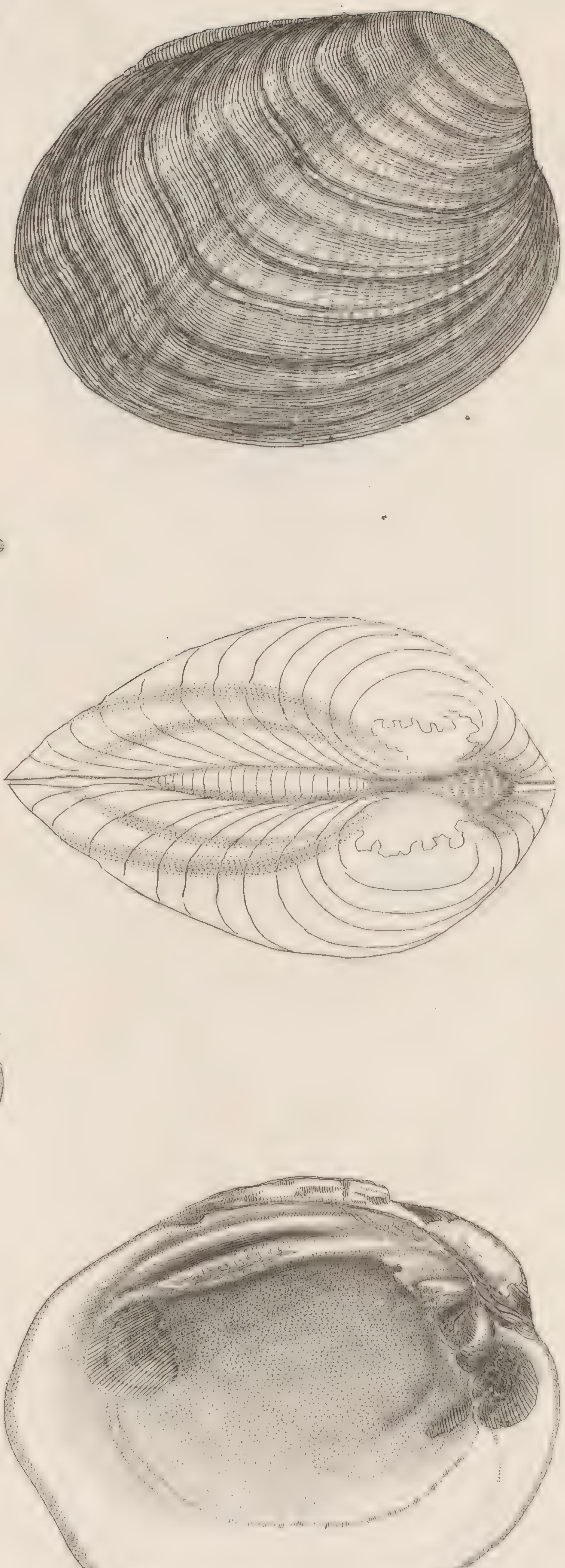
Unio rubiginosus.

11



Unio heterodon.

12

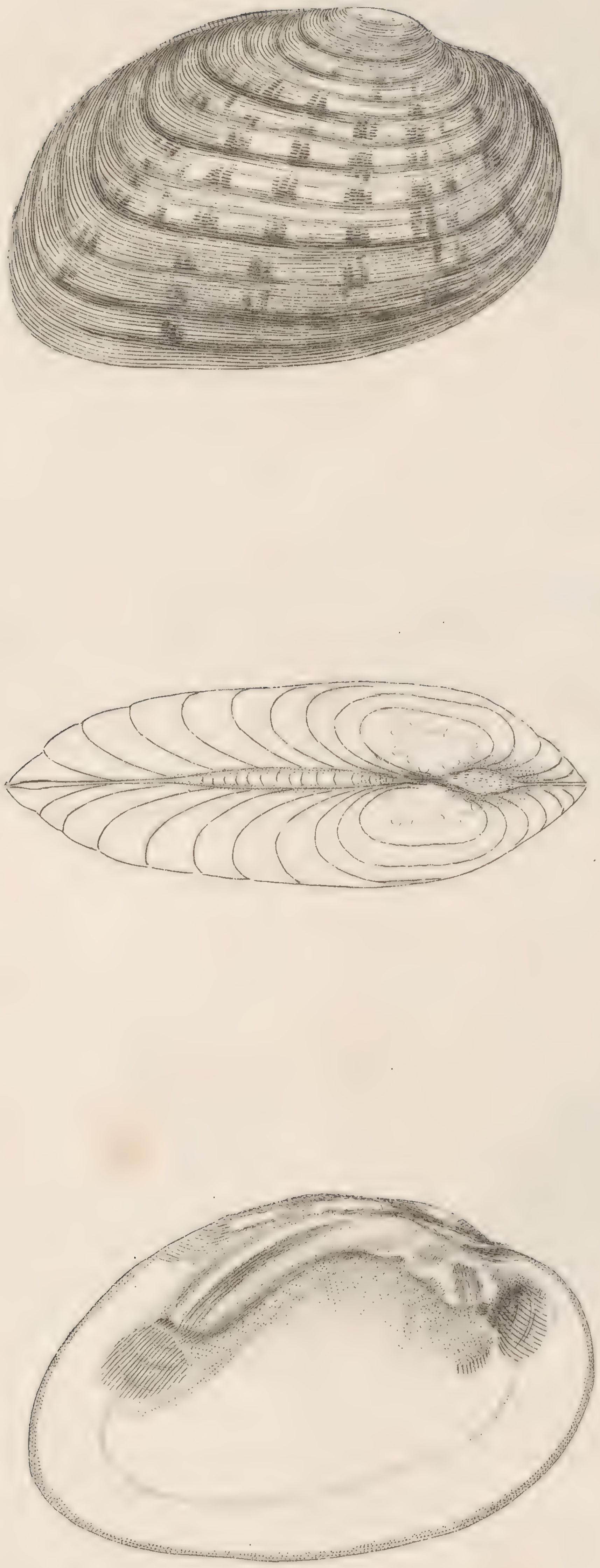


Unio sulcatus.

Drawn & Engd. by J. Drayton

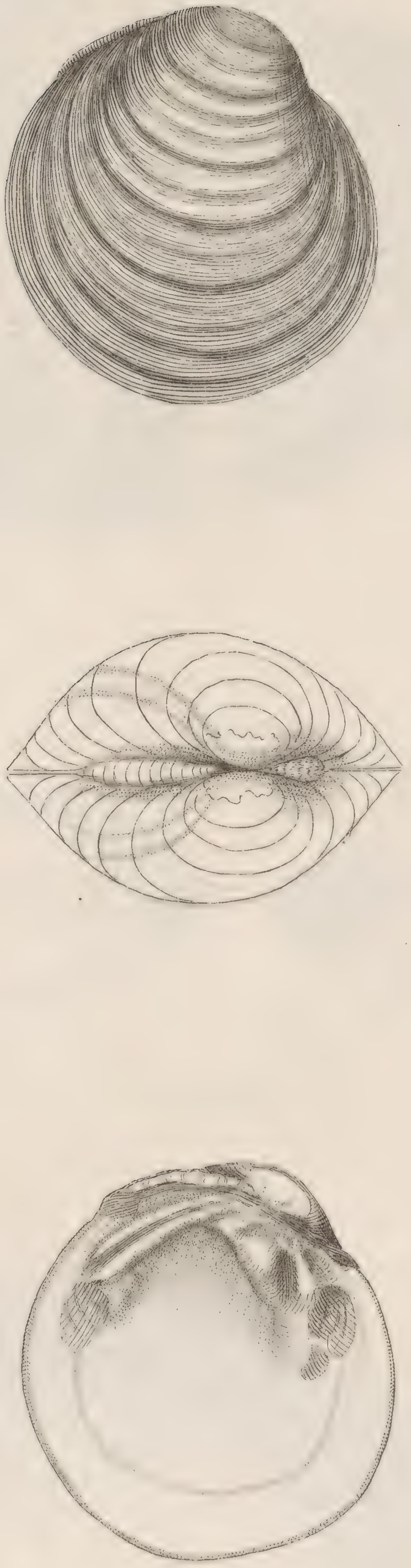
PL. IX Vol. 3.

13



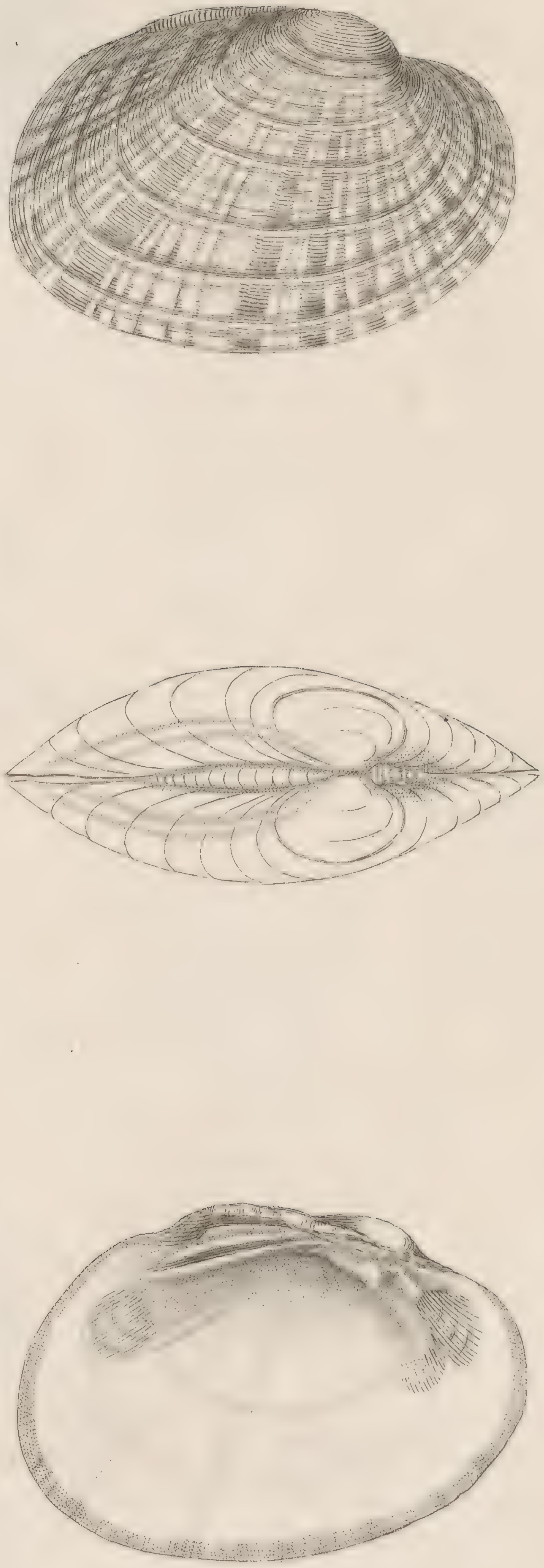
Unio planulatus.

14



Unio circulus.

15

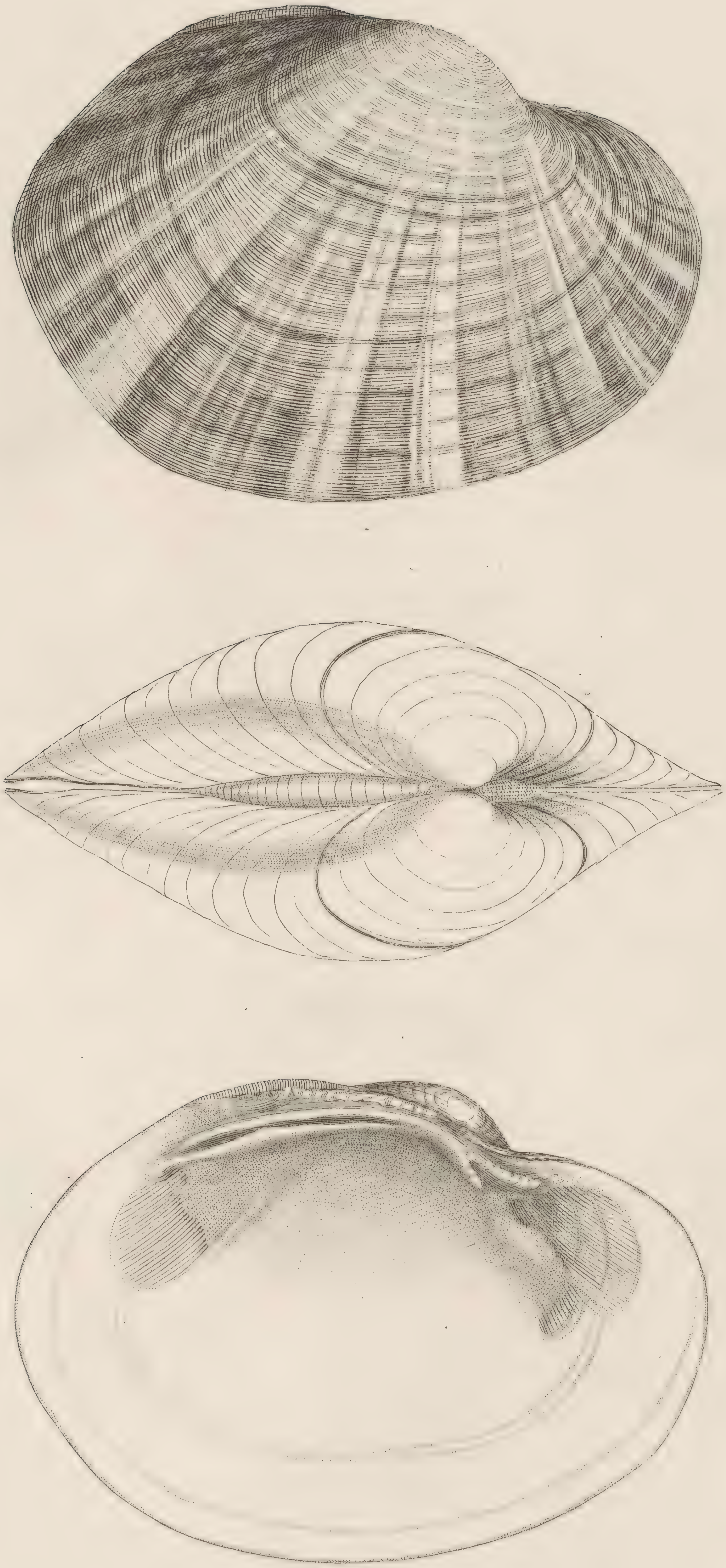


Unio multiradiatus.

Drawn & Eng'd by J. Drayton.

PL. X Vol. 3.

16

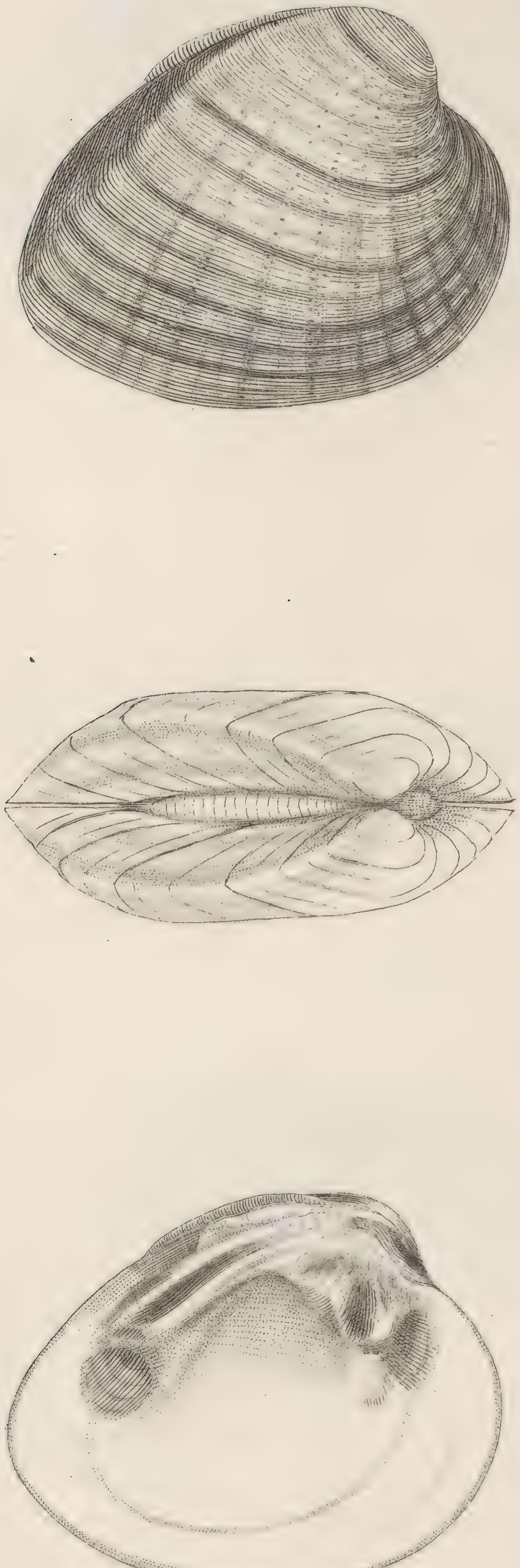


Unio occidens.

Drawn & Eng'd by J. Drayton.

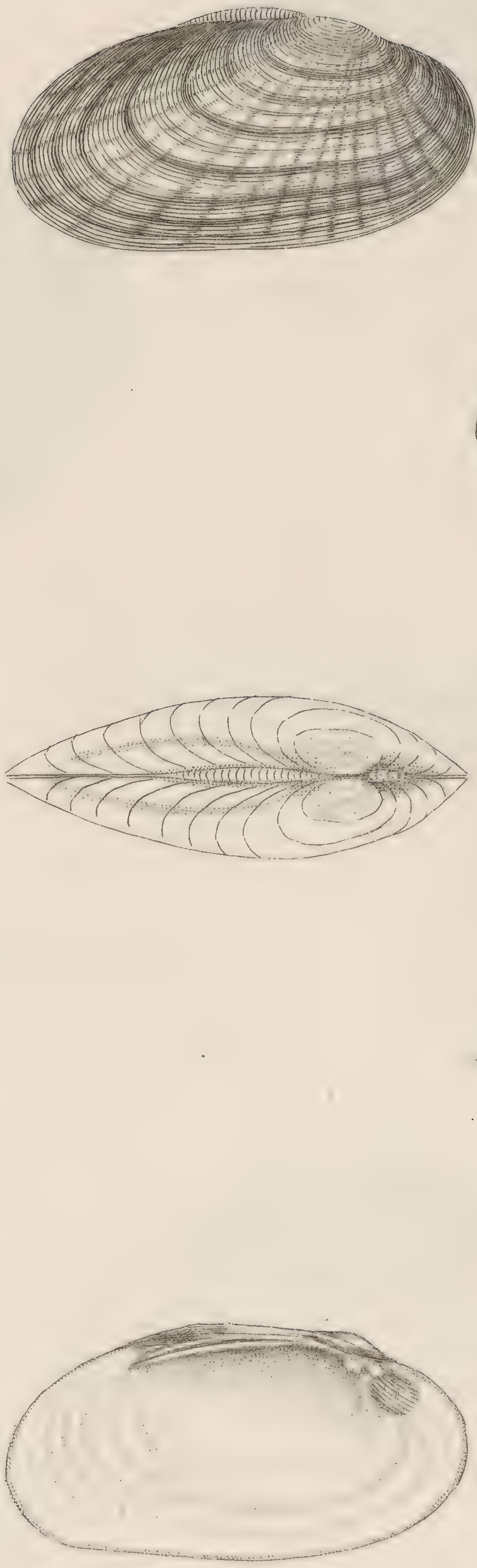
PL. XI Vol. 3.

17



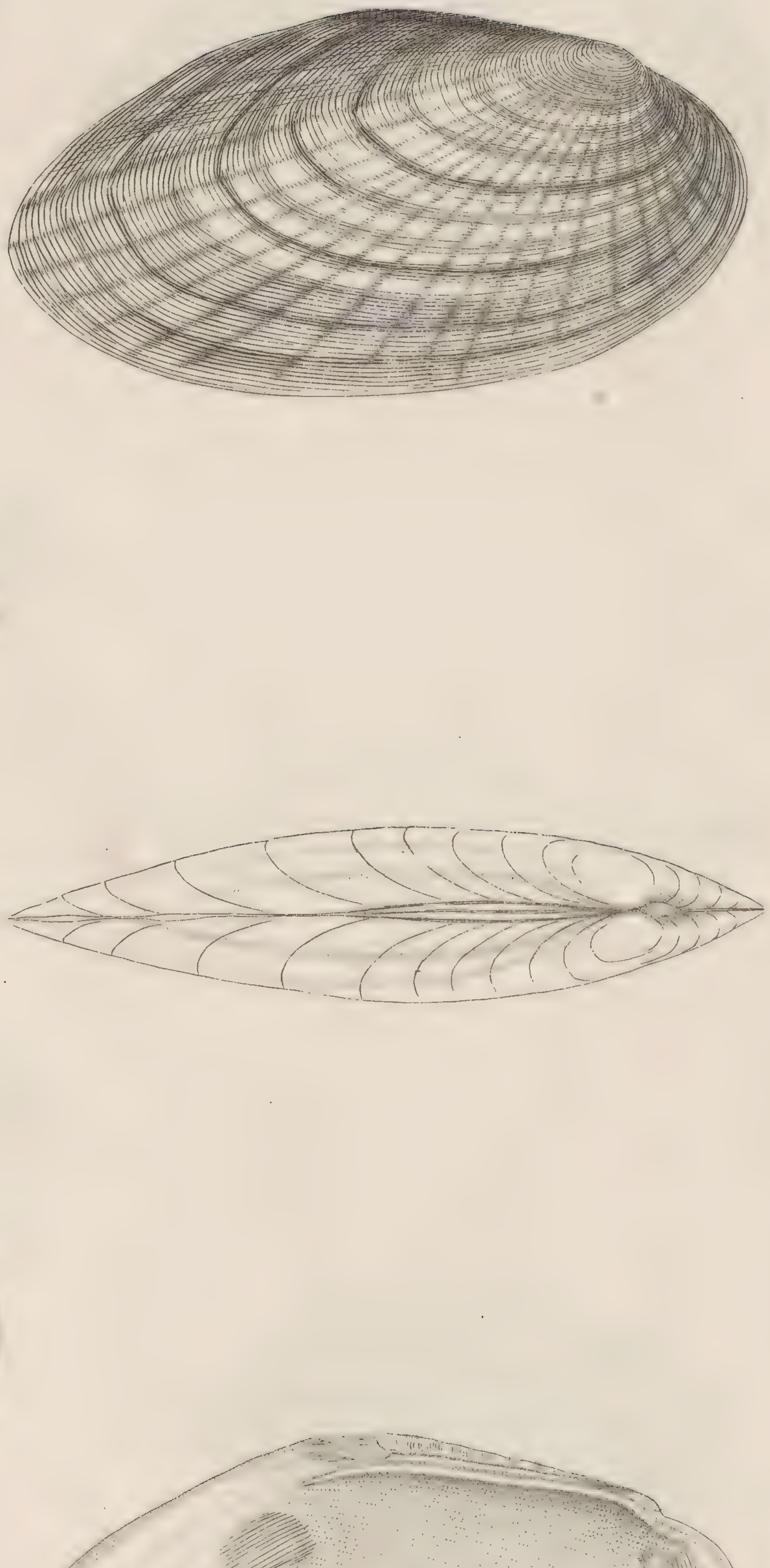
Unio securis

18



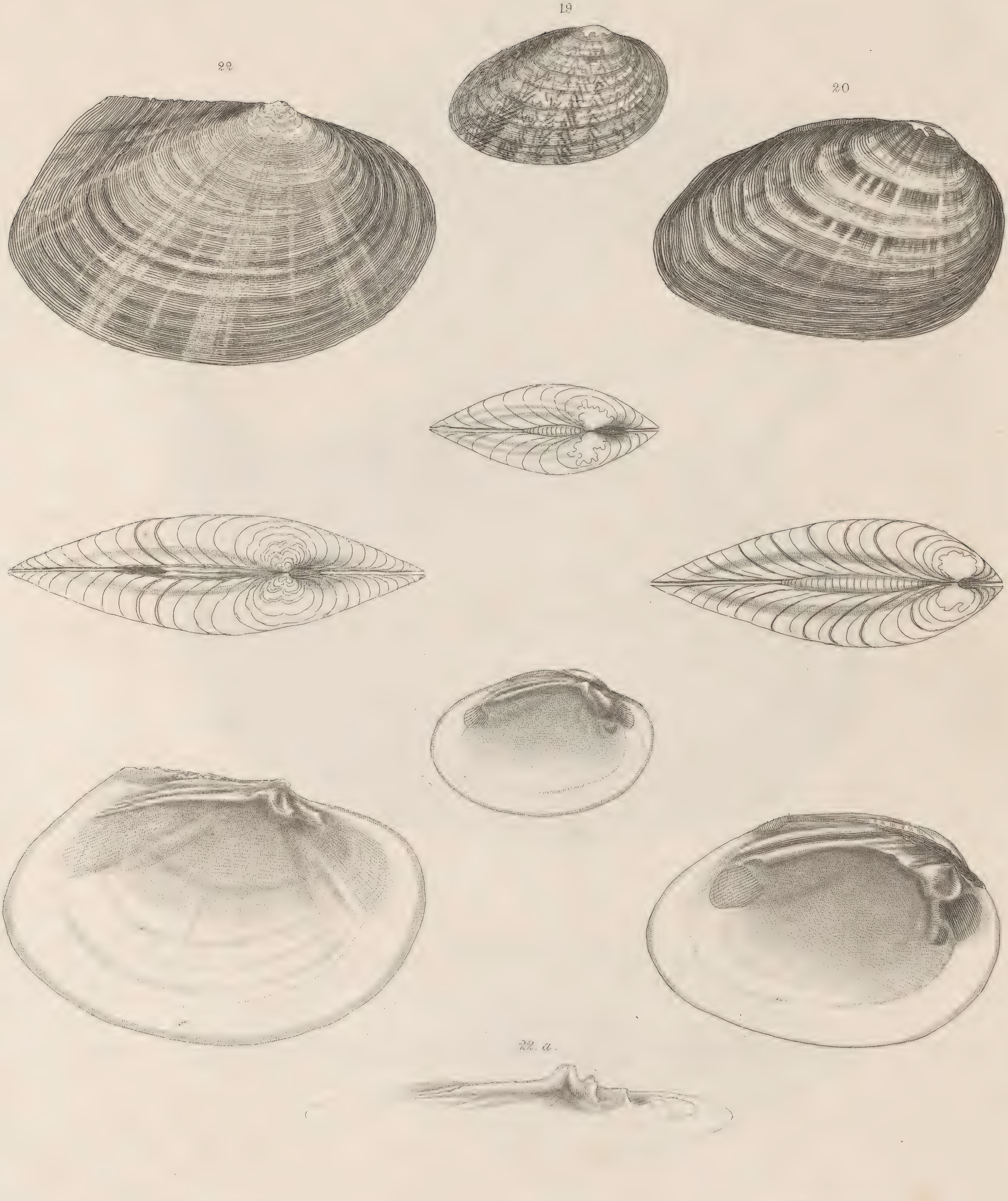
Unio iris

21



Symphynota tenuissima.

Drawn & Eng'd by J. Drayton

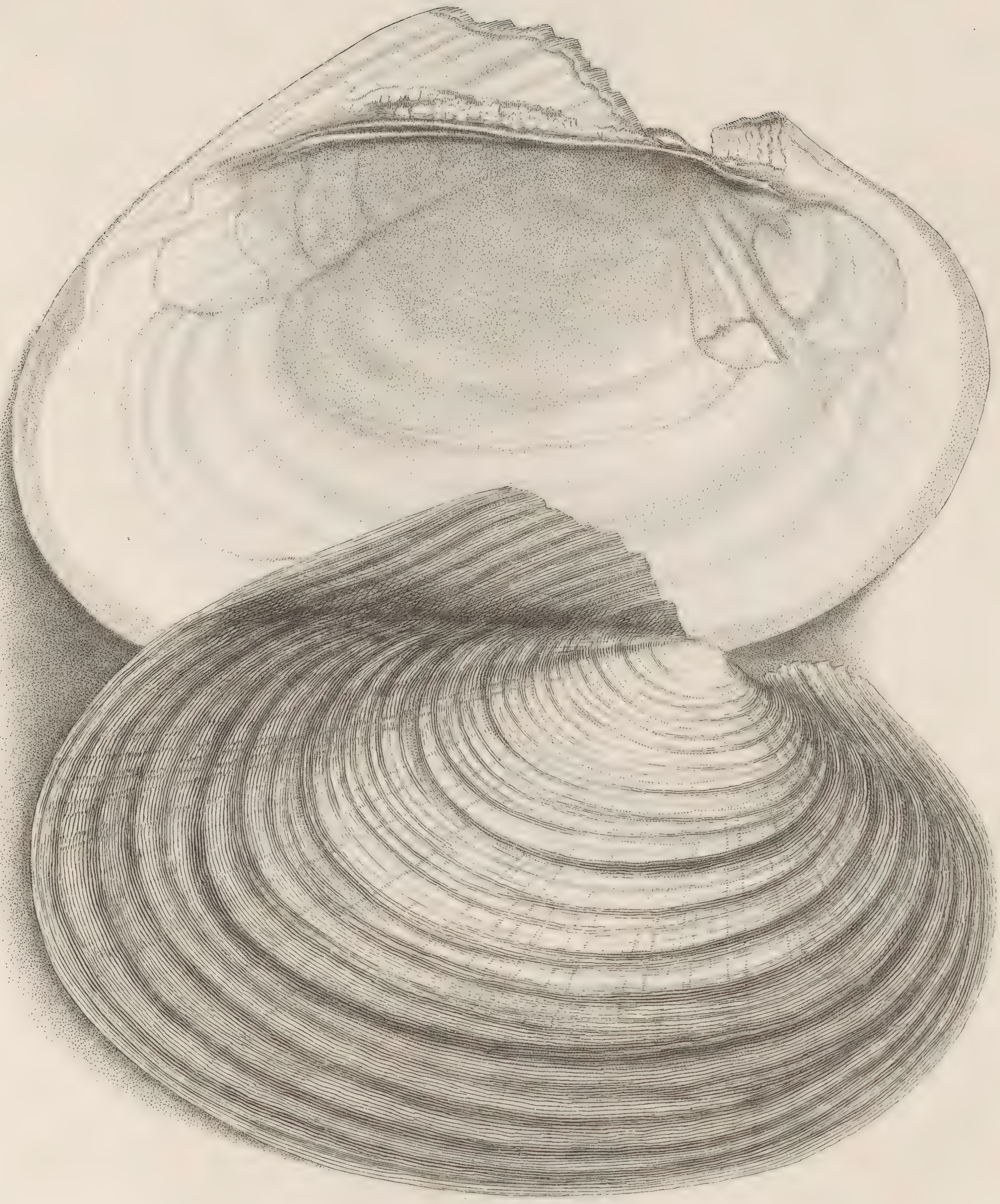


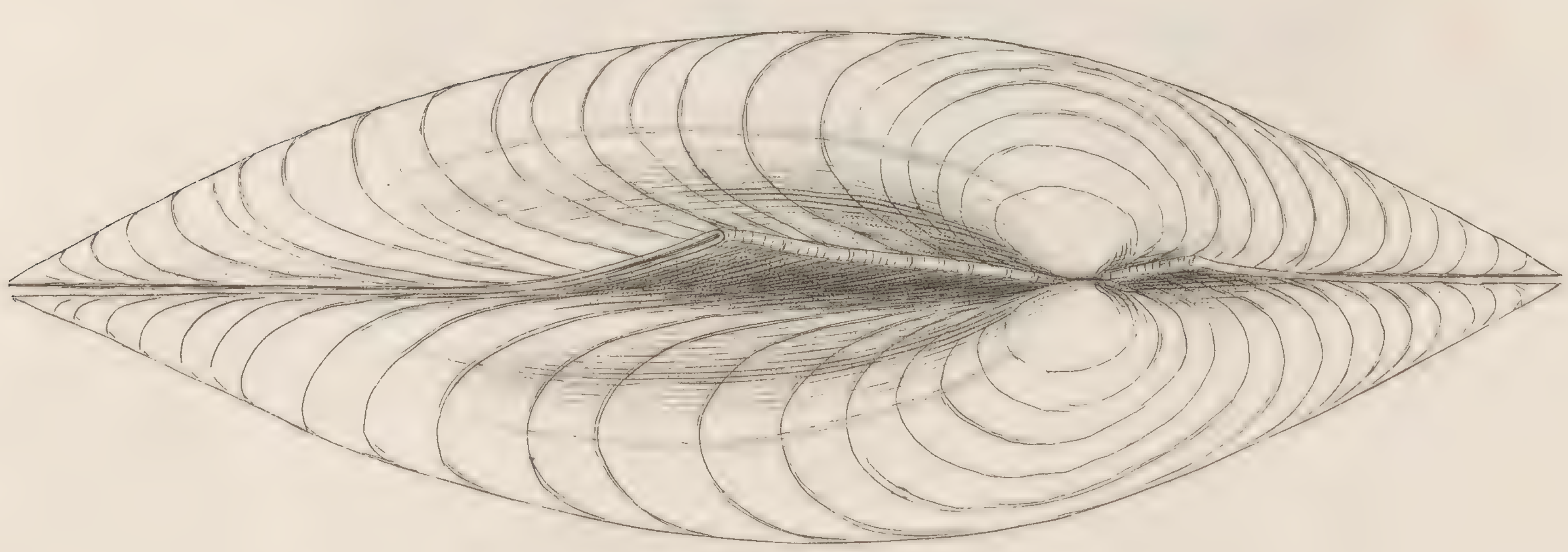
Symphynota compressa. *Unio zig-zag.* *Unio patulus.*

Drawn & Eng.d by J. Drayton.

PL.XIII vol.3.

23



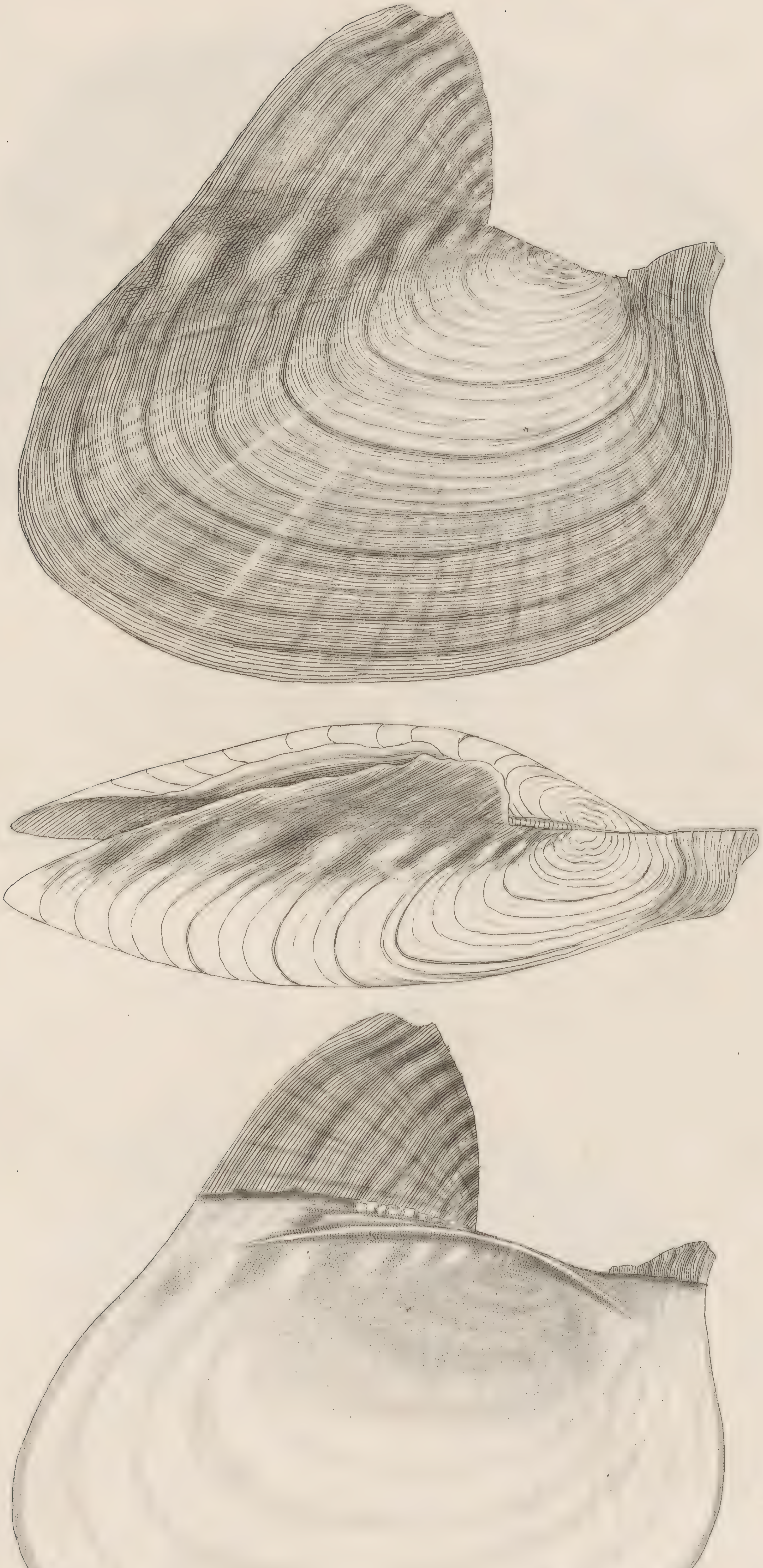


Symphynota lævissima

Drawn & Eng^d by J.Drayton.

PL. XIV Vol. 3.

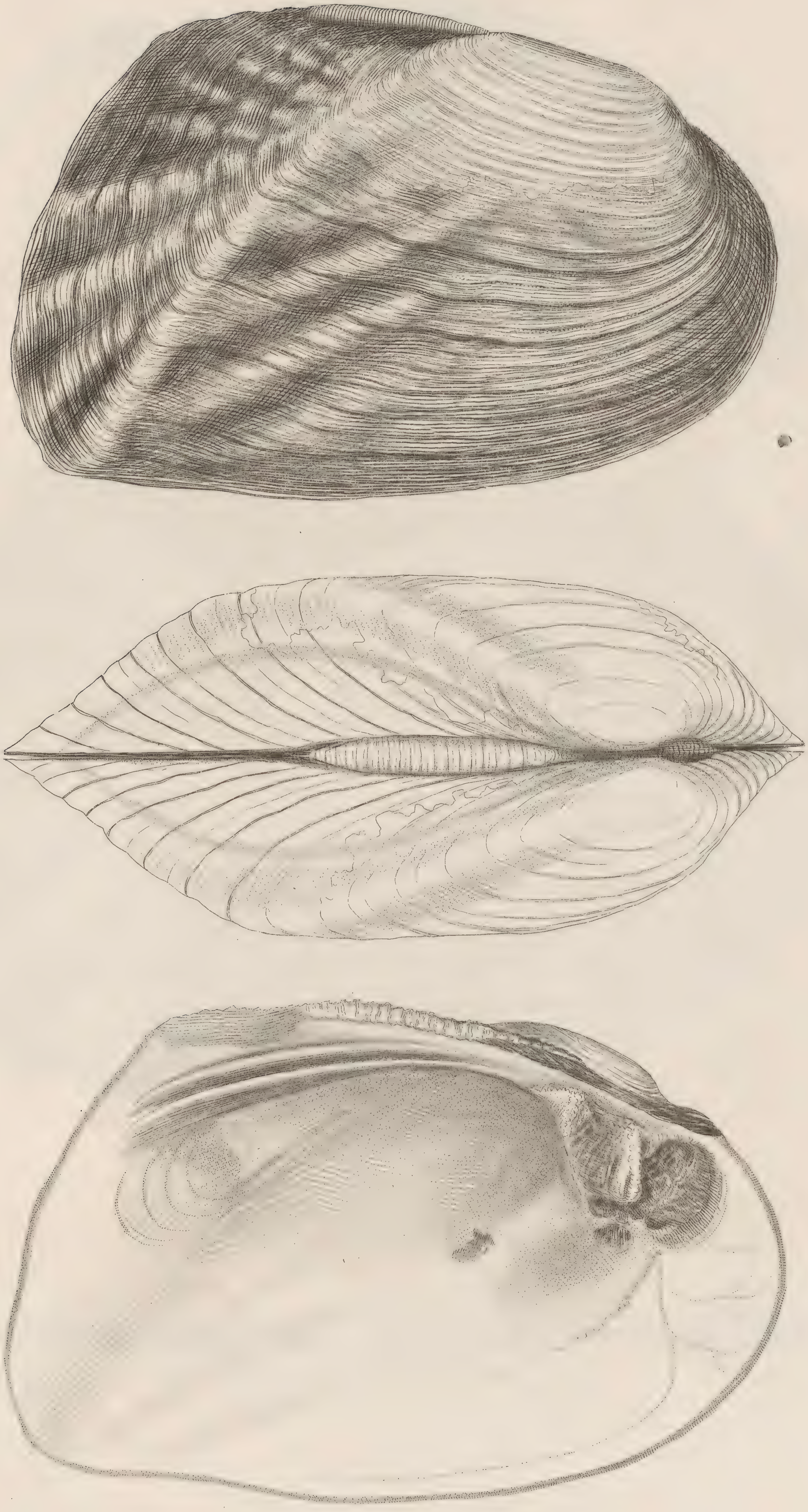
24



Symphynota bi-alata.

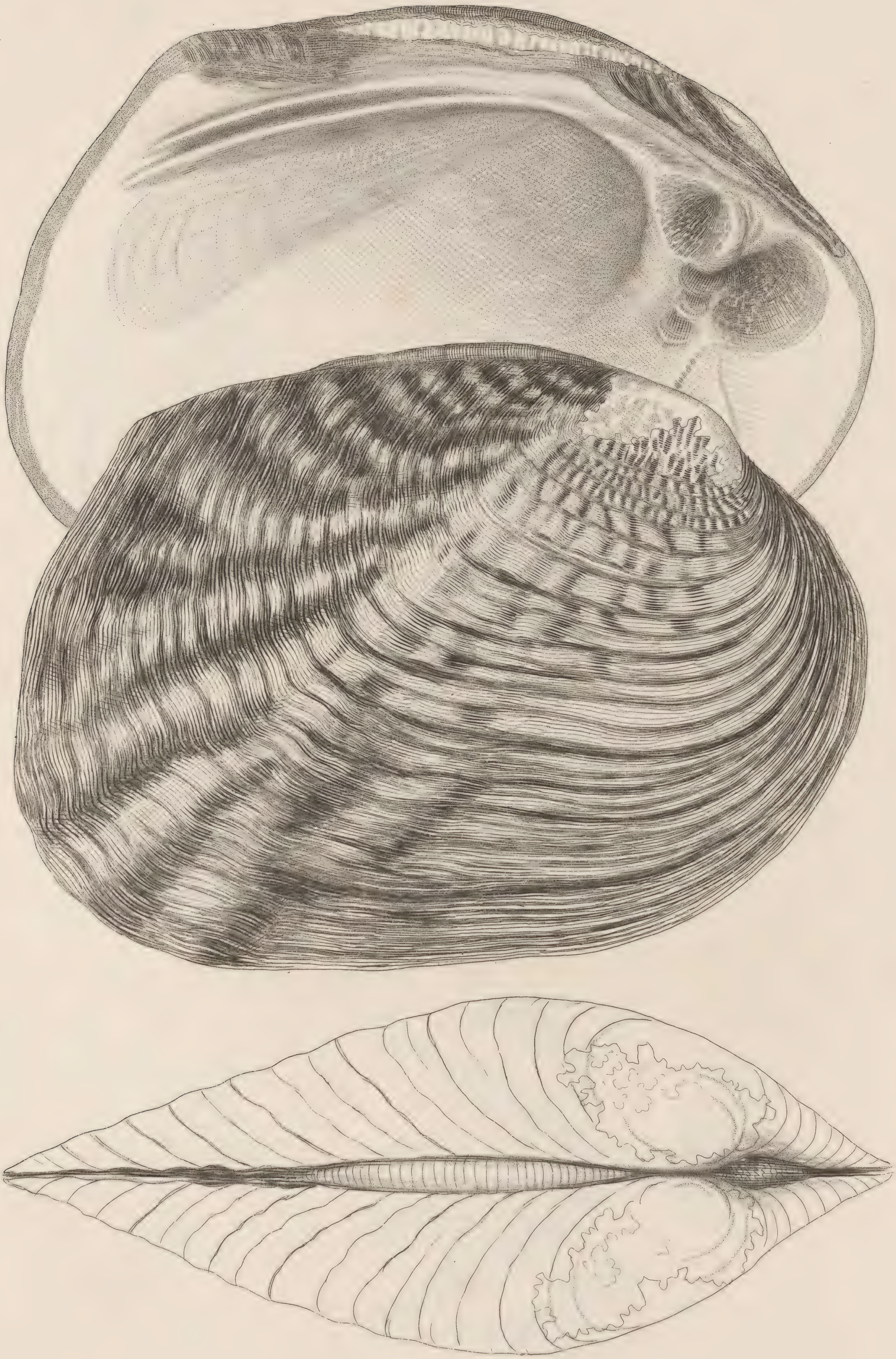
Drawn & Eng'd by J. Drayton

PL. III. Vol. 4.



Unio trapezoides

Drawn & Eng d. by J Drayton

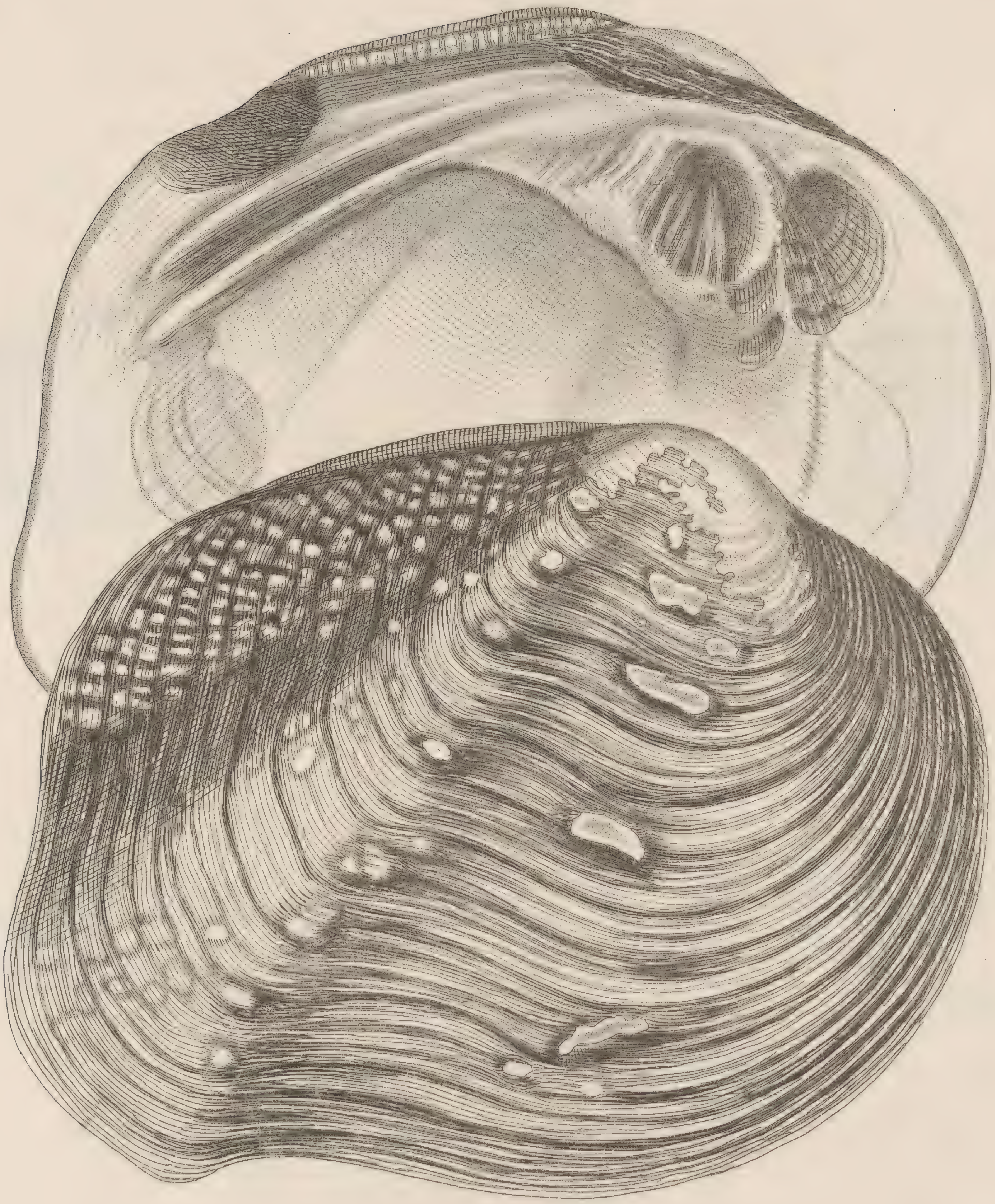


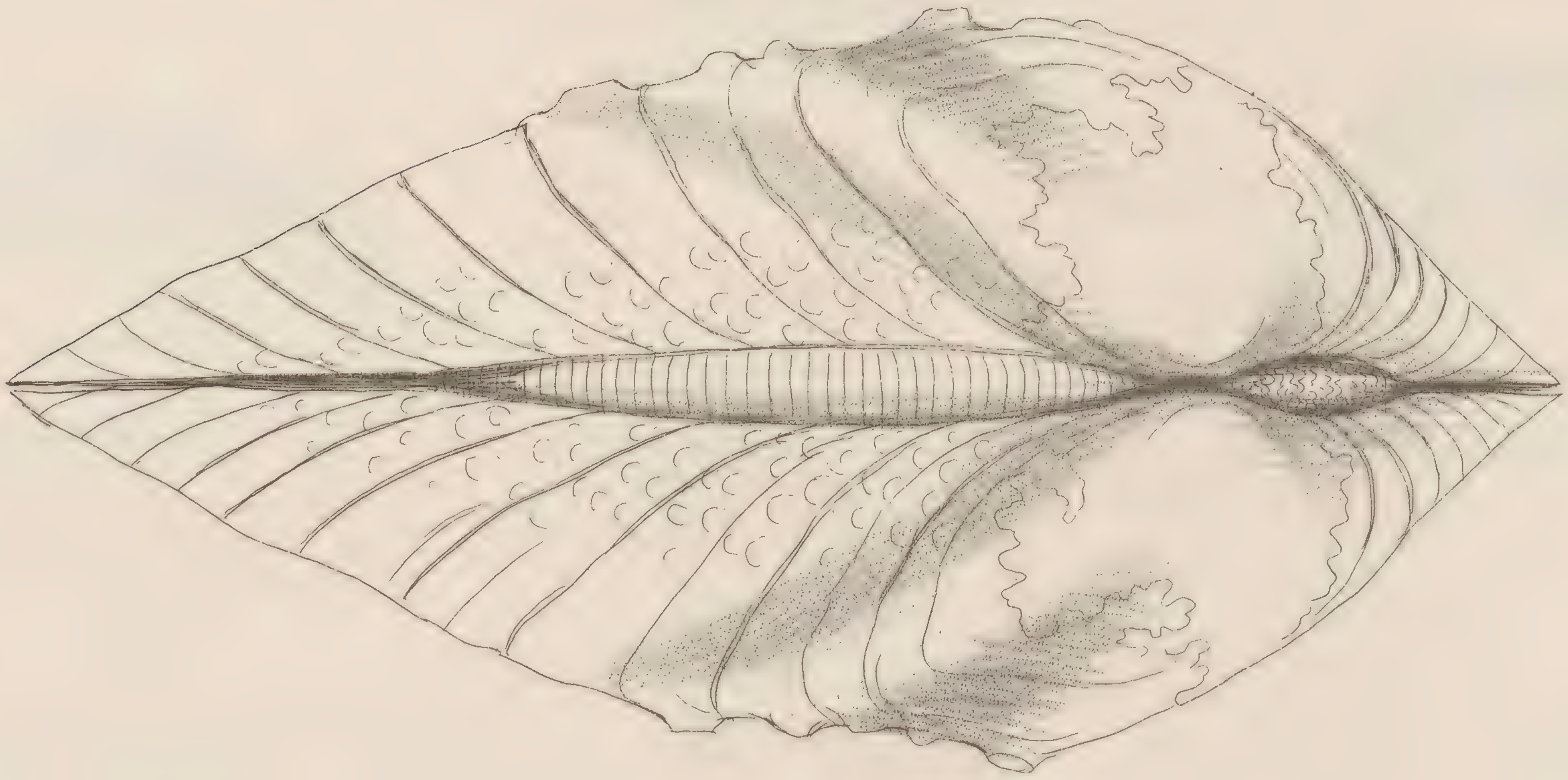
Unio multiplicatus

Drawn & Eng'd by J. Drayton

PL.V. Vol.4.

3

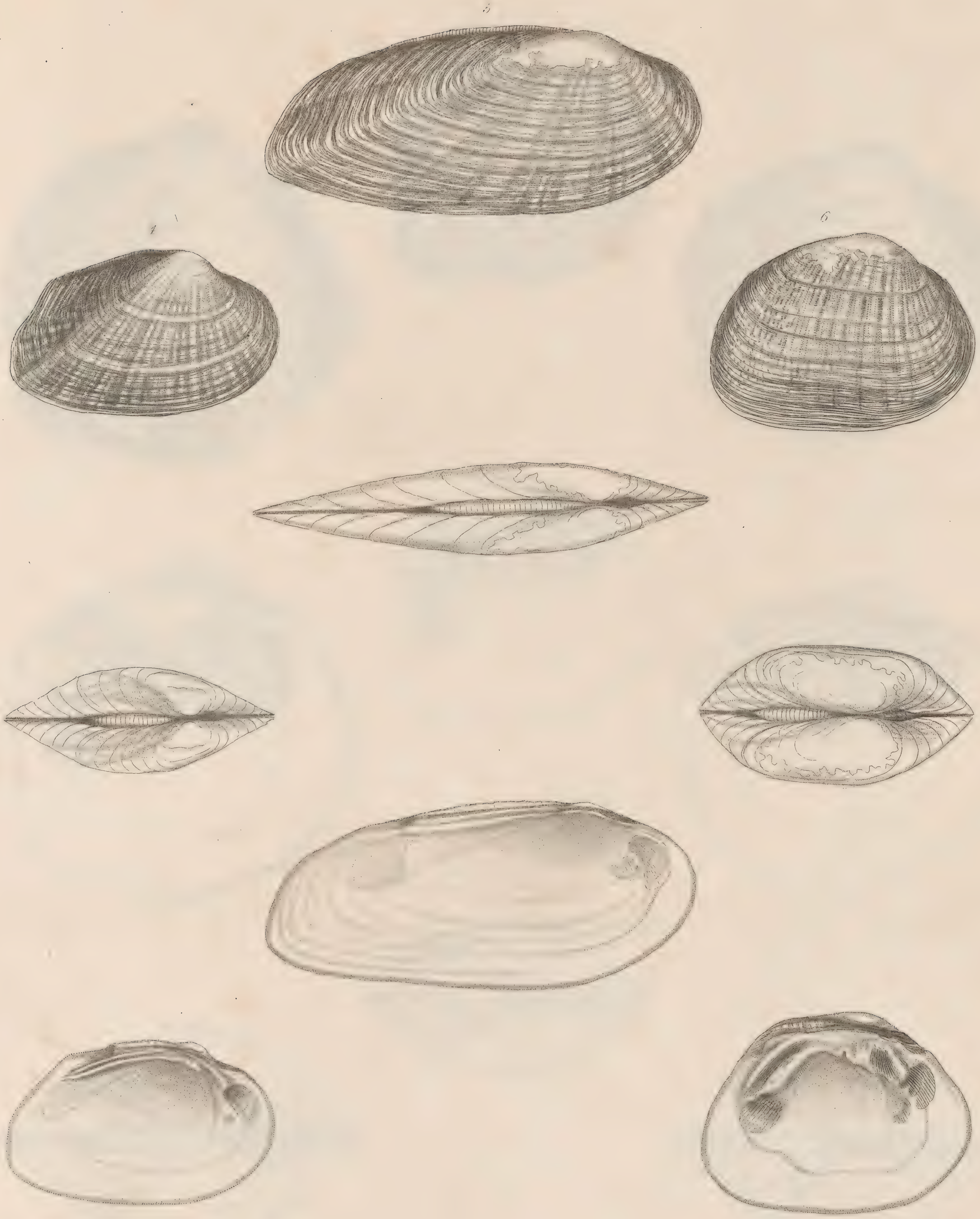




Unio asperimus.

Drawn.&.Eng'd by J.Drayton.

PL. VI. Vol. 4.



Unio oriens.

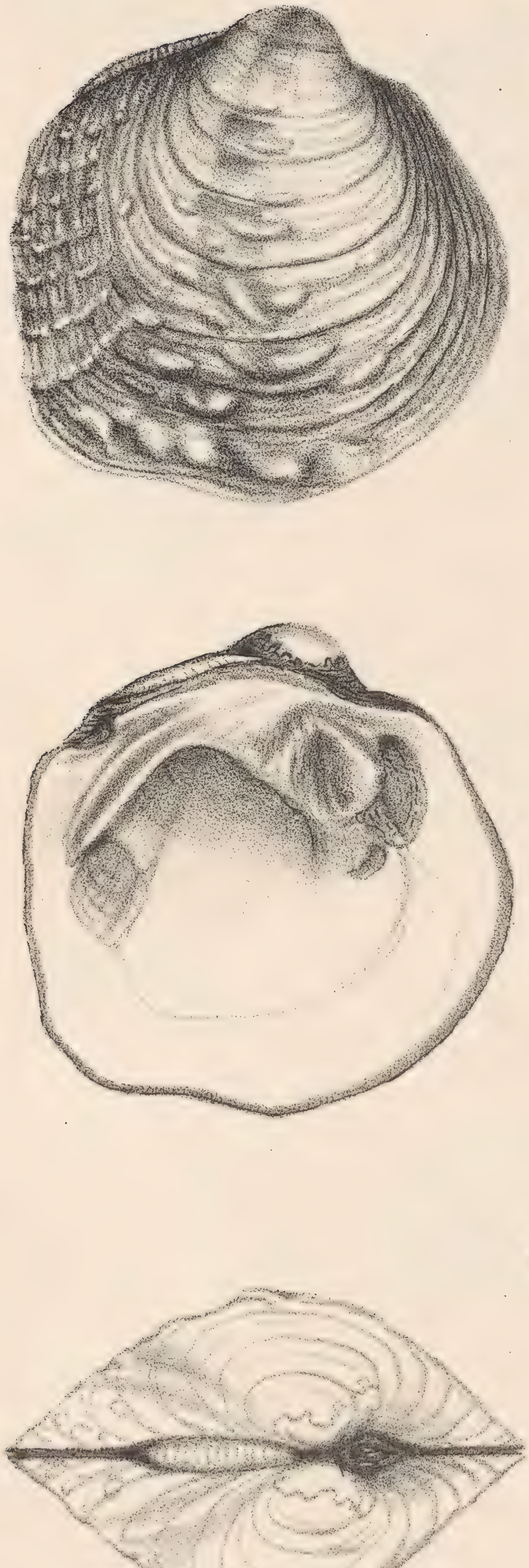
Unio congrœus.

Unio brevidens.

Drawn & Eng'd by J Drayton

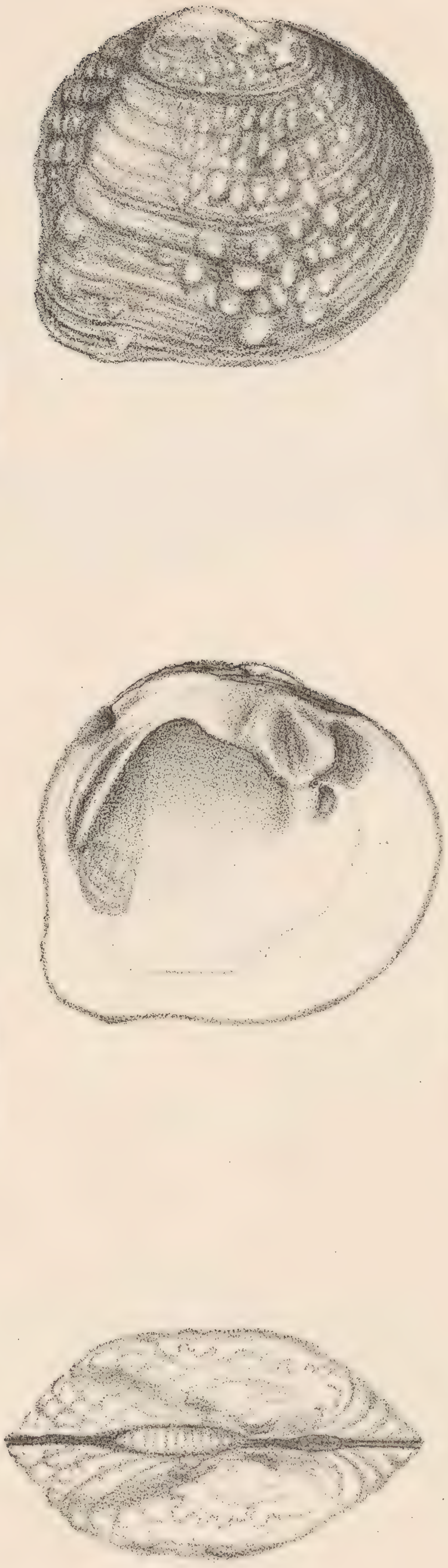
PL. VII Vol. 4.

7



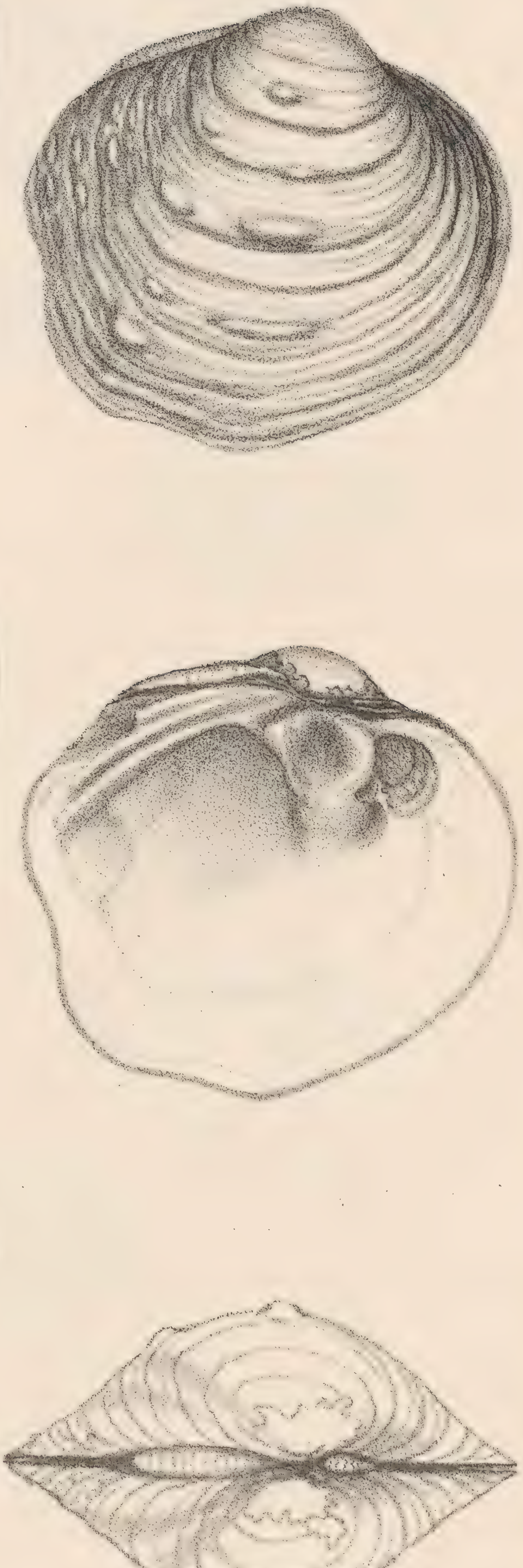
Unio pustulosus.

8



Unio stapes.

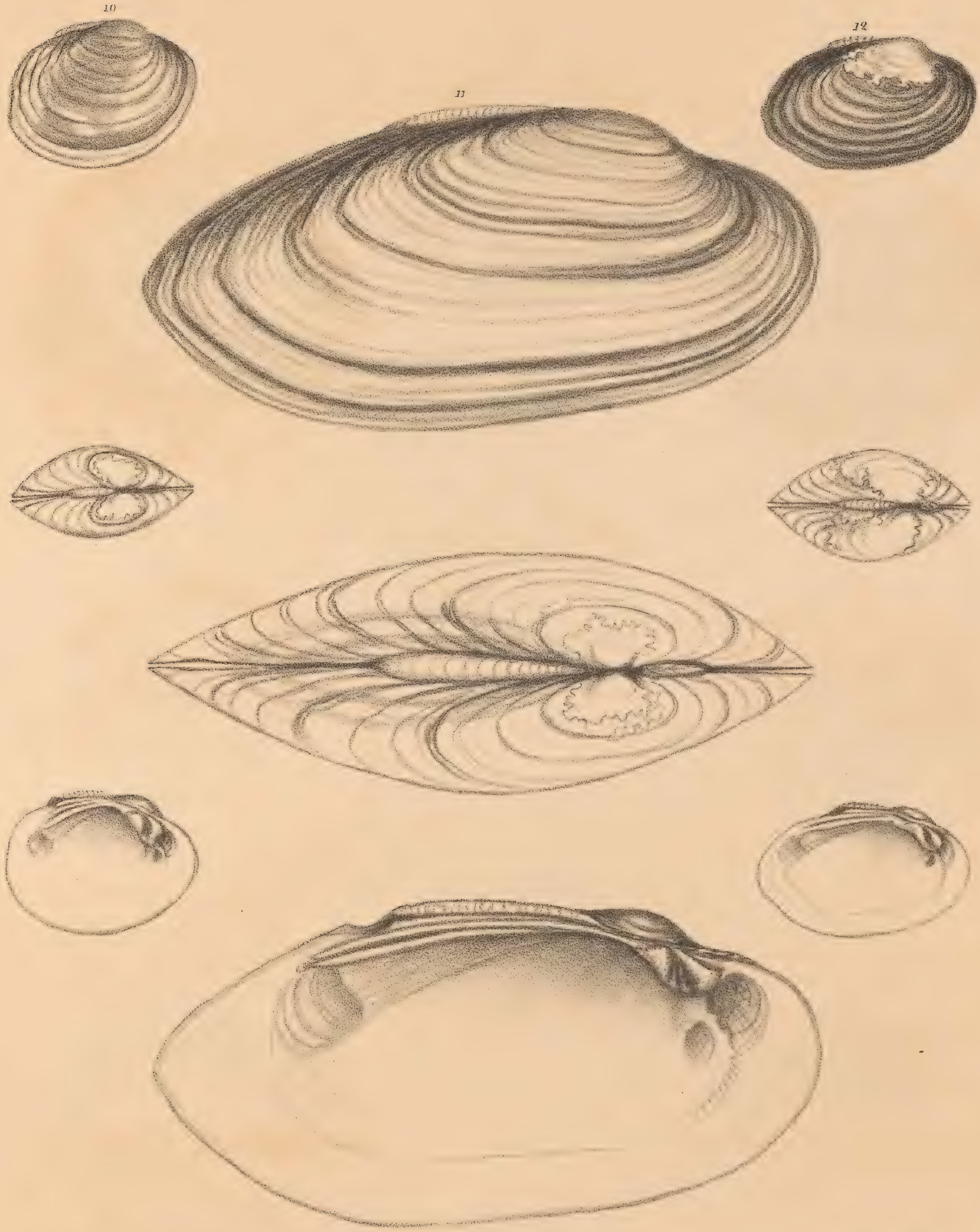
9



Unio pustulatus.

Drawn by J. Drayton.

PL. VIII Vol. 4.



Unio lens.

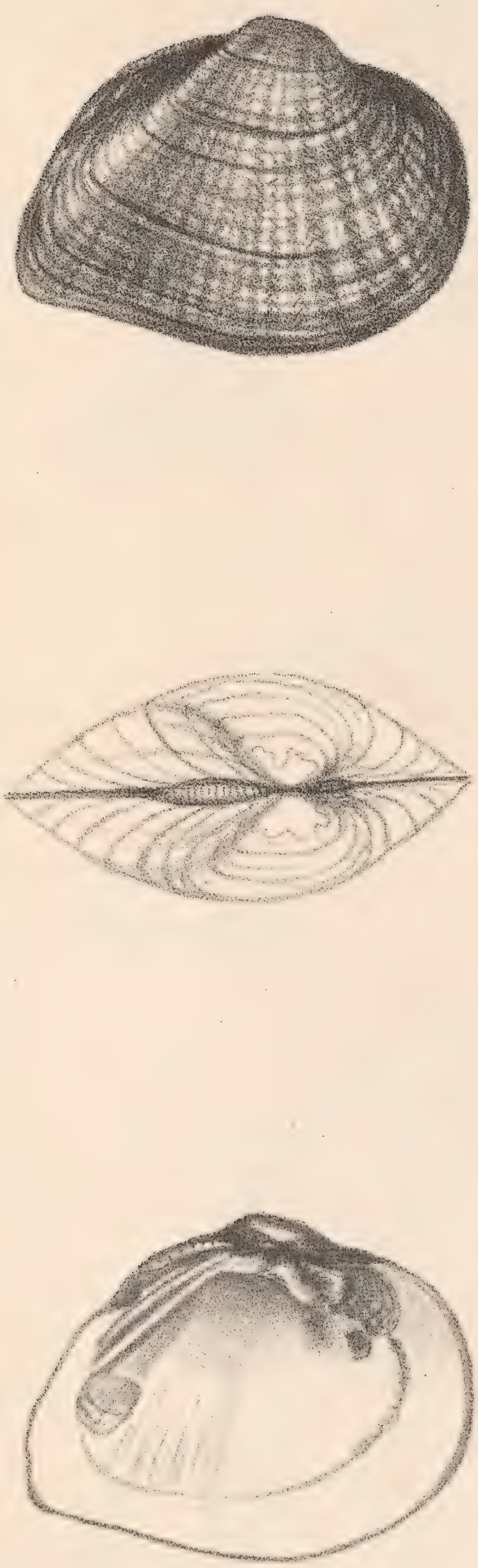
Unio glans.

Unio anodontoides.

Drawn by J. Drayton.

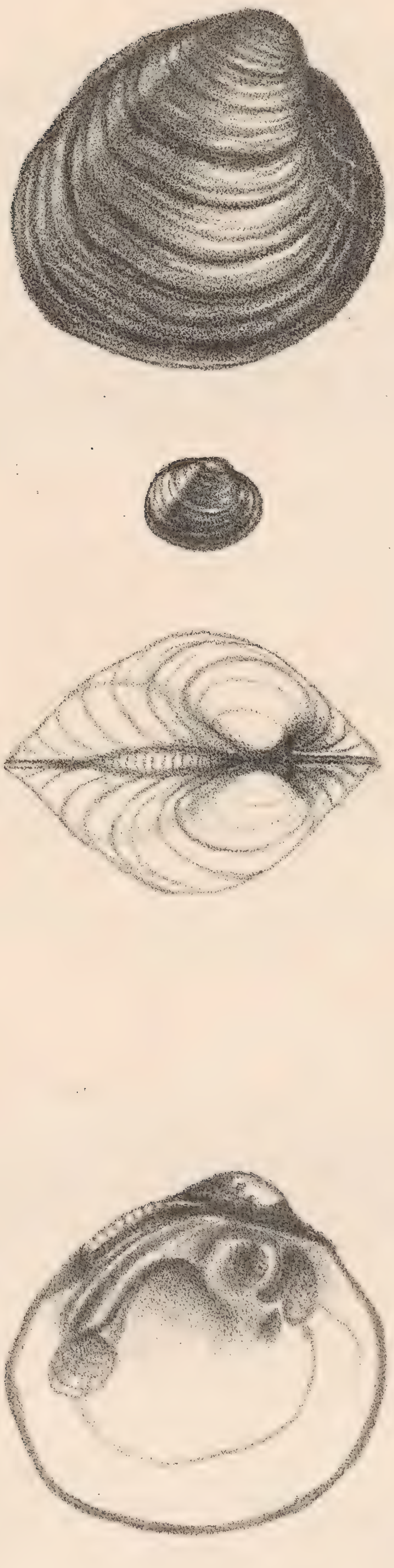
9

13



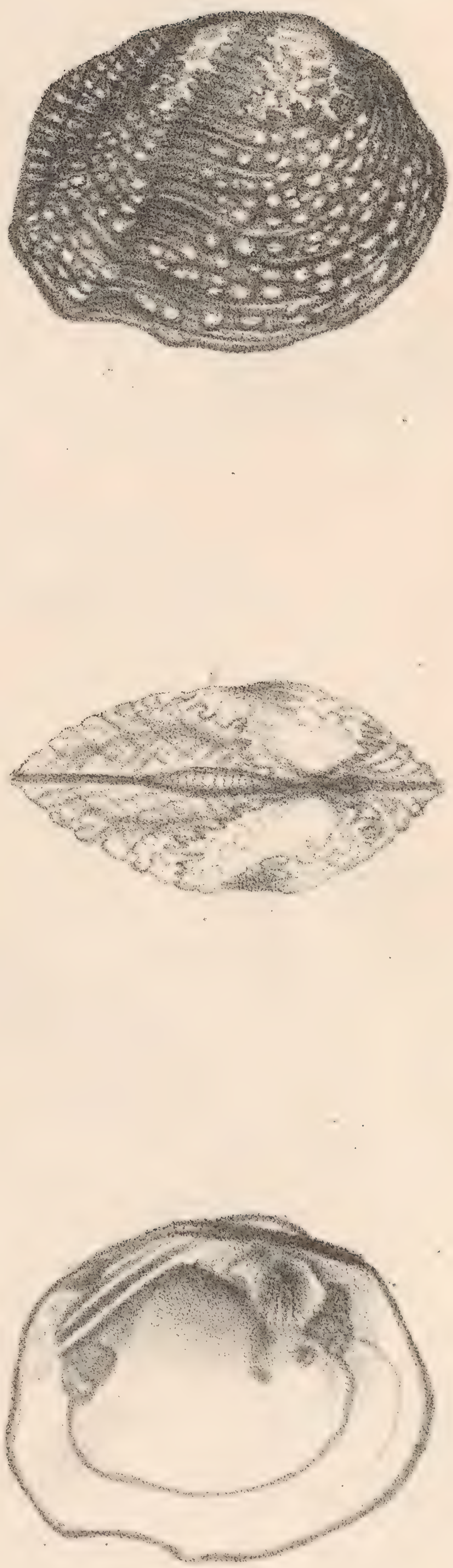
Unio elegans

14



Unio ebenus.

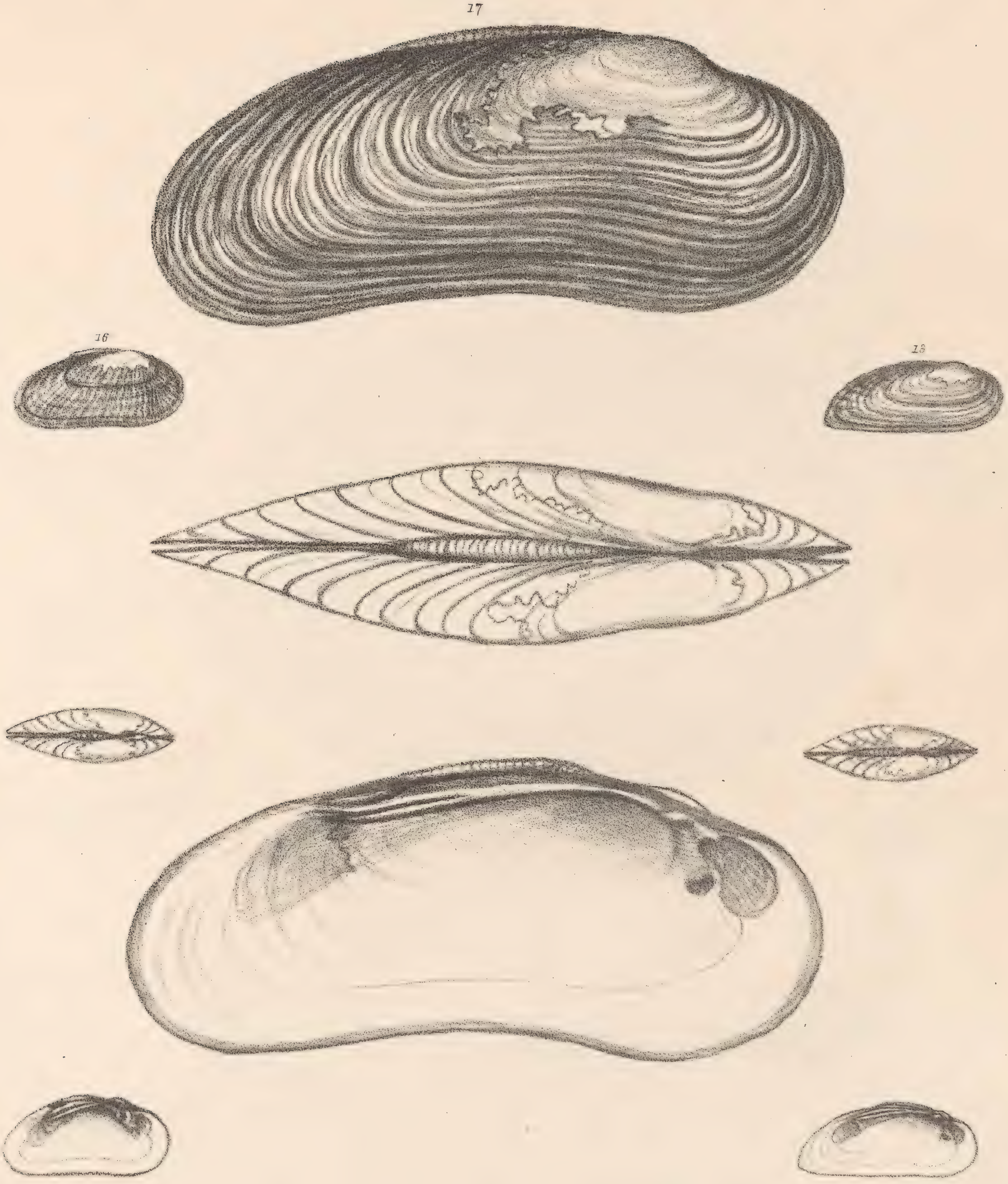
15



Unio asper.

Drawn by J. Drayton .

PL. X, Vol. 4.



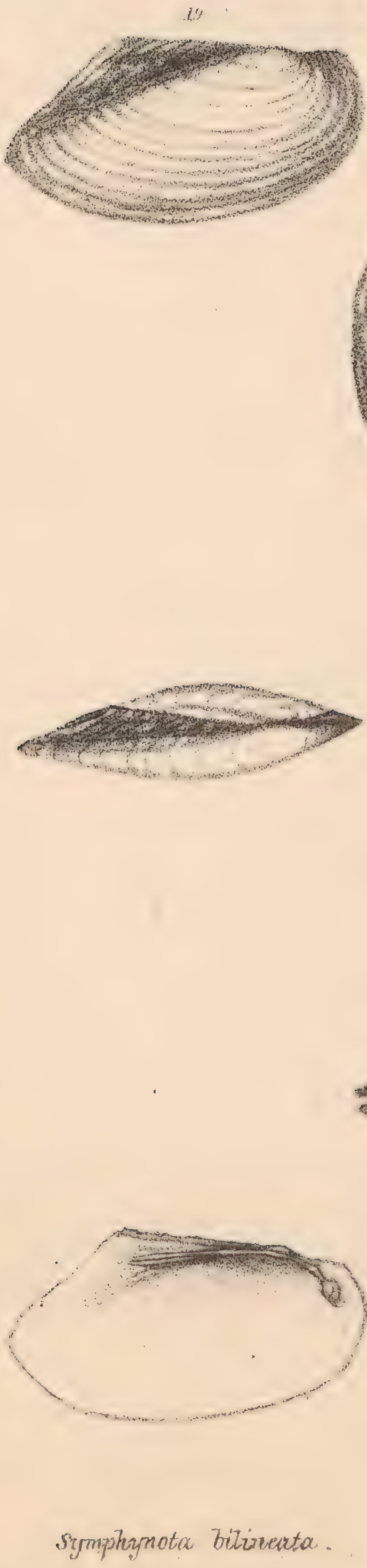
Unio soleniformis.

Unio fabalis

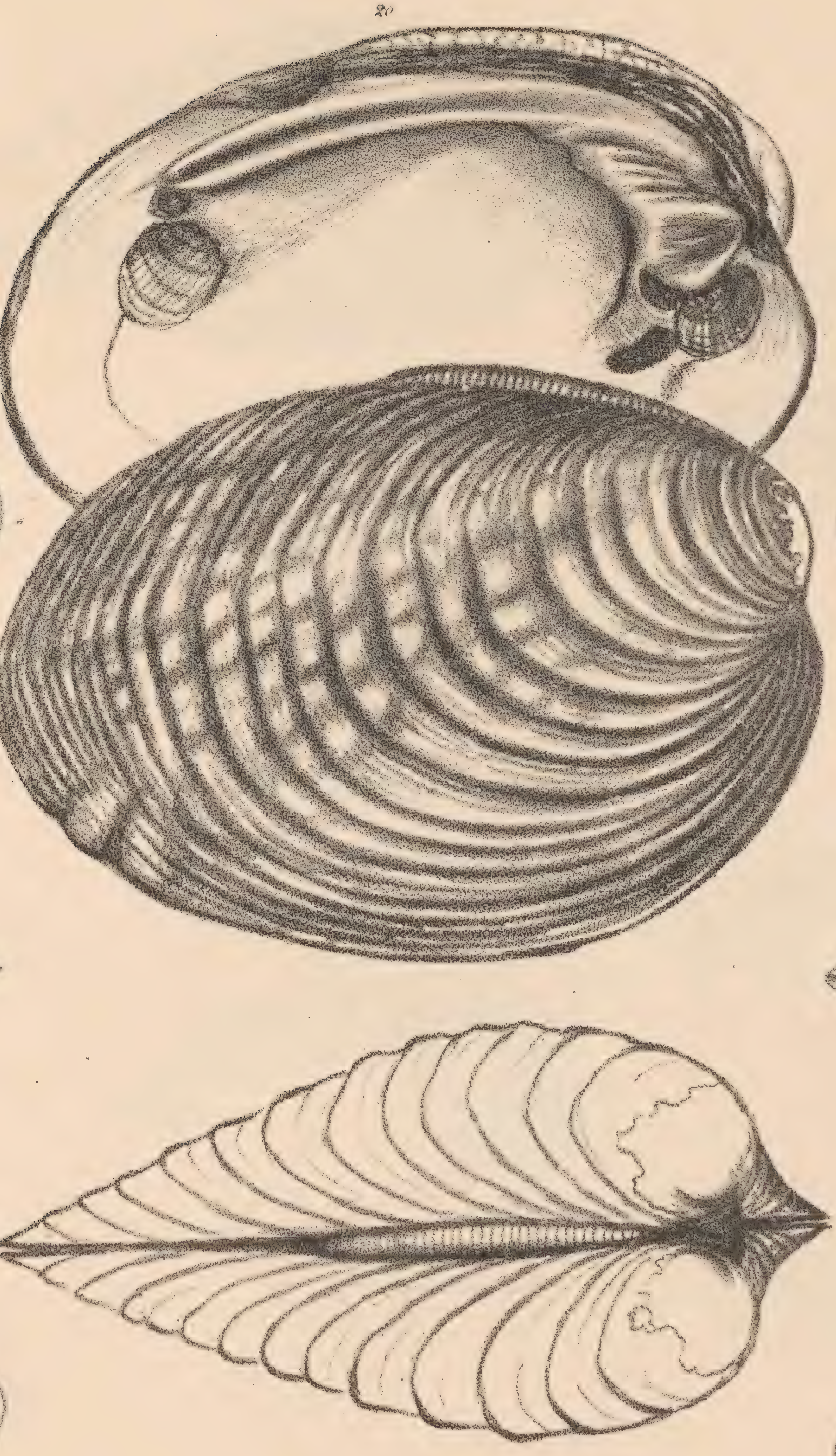
Unio acutissimus.

Drawn by J.Drayton

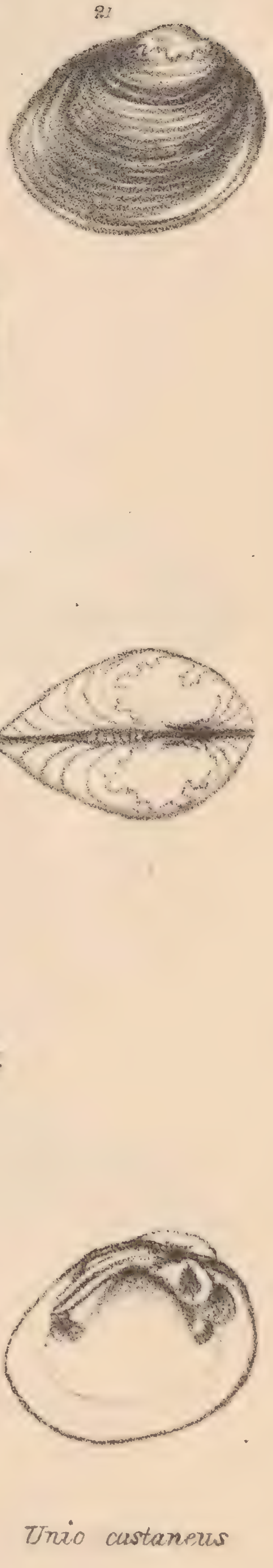
PL. XI. Vol. 4.



Symphynota bilineata.



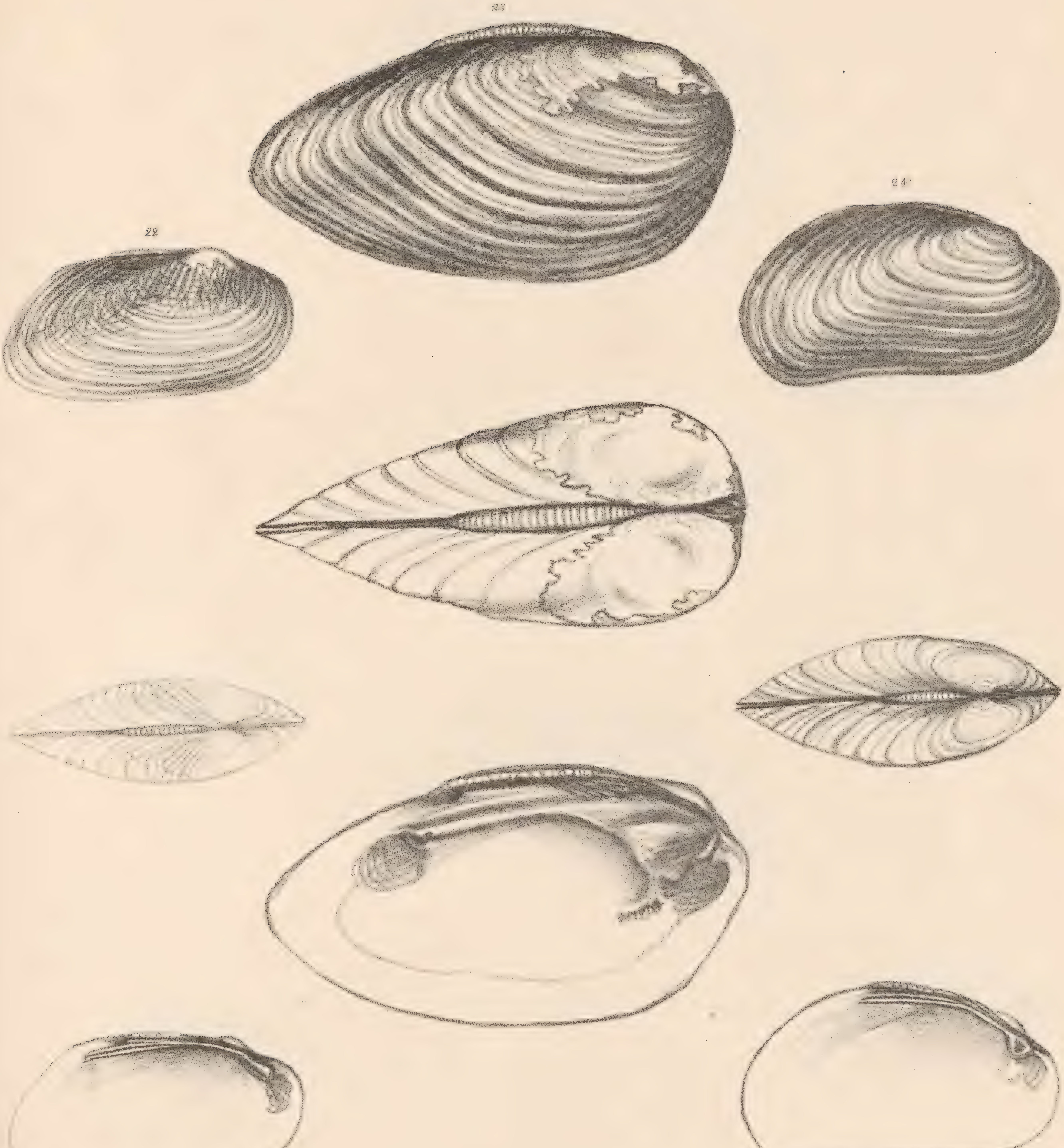
Unio varicosus



Unio castaneus

Drawn by J. Drayton

PL. XII. Vol. 4.



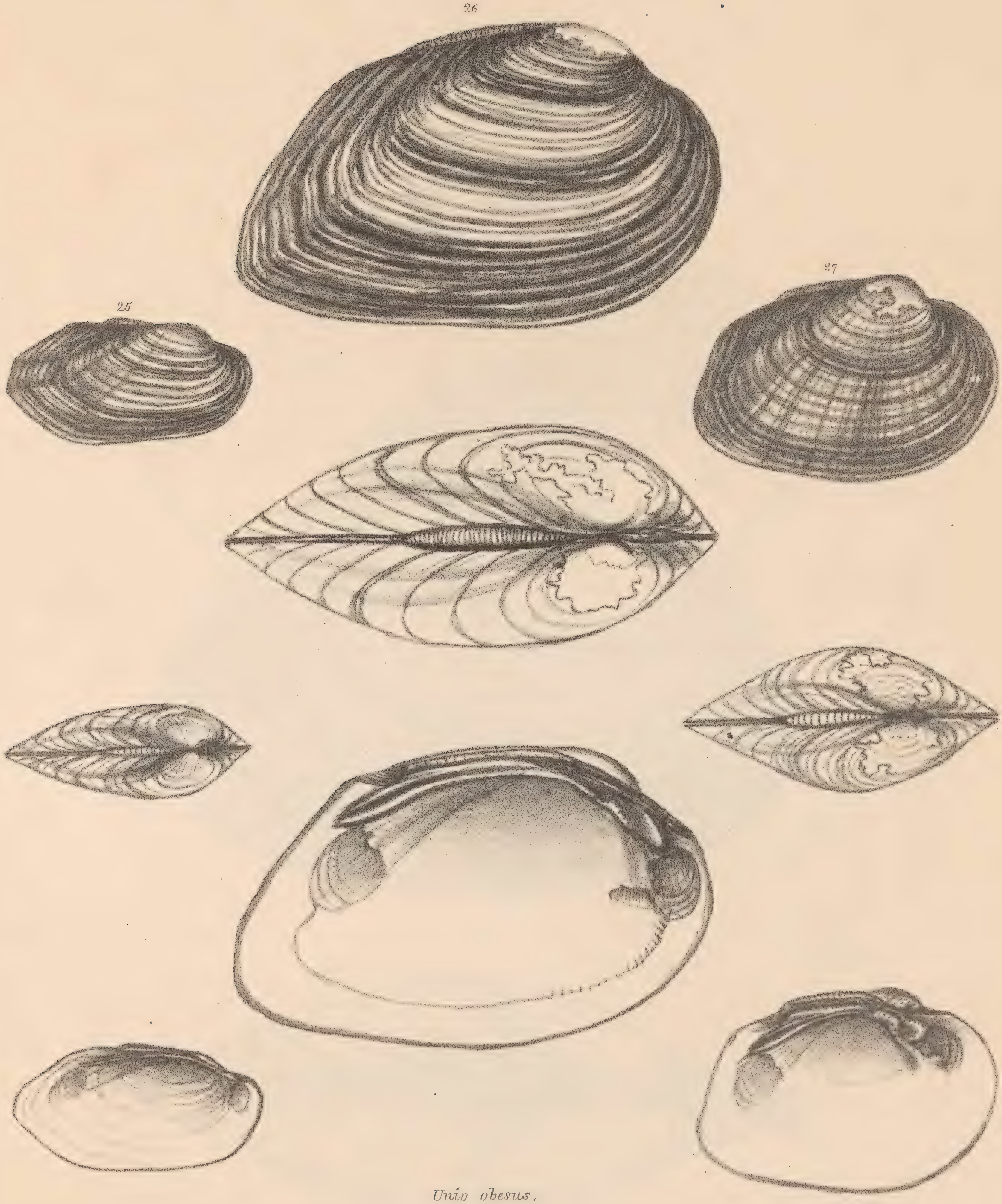
Unio decisus.

Unio multistriatus.

Unio caprinus.

Drawn by J. Drayton.

PL. XIII. Vol. 4



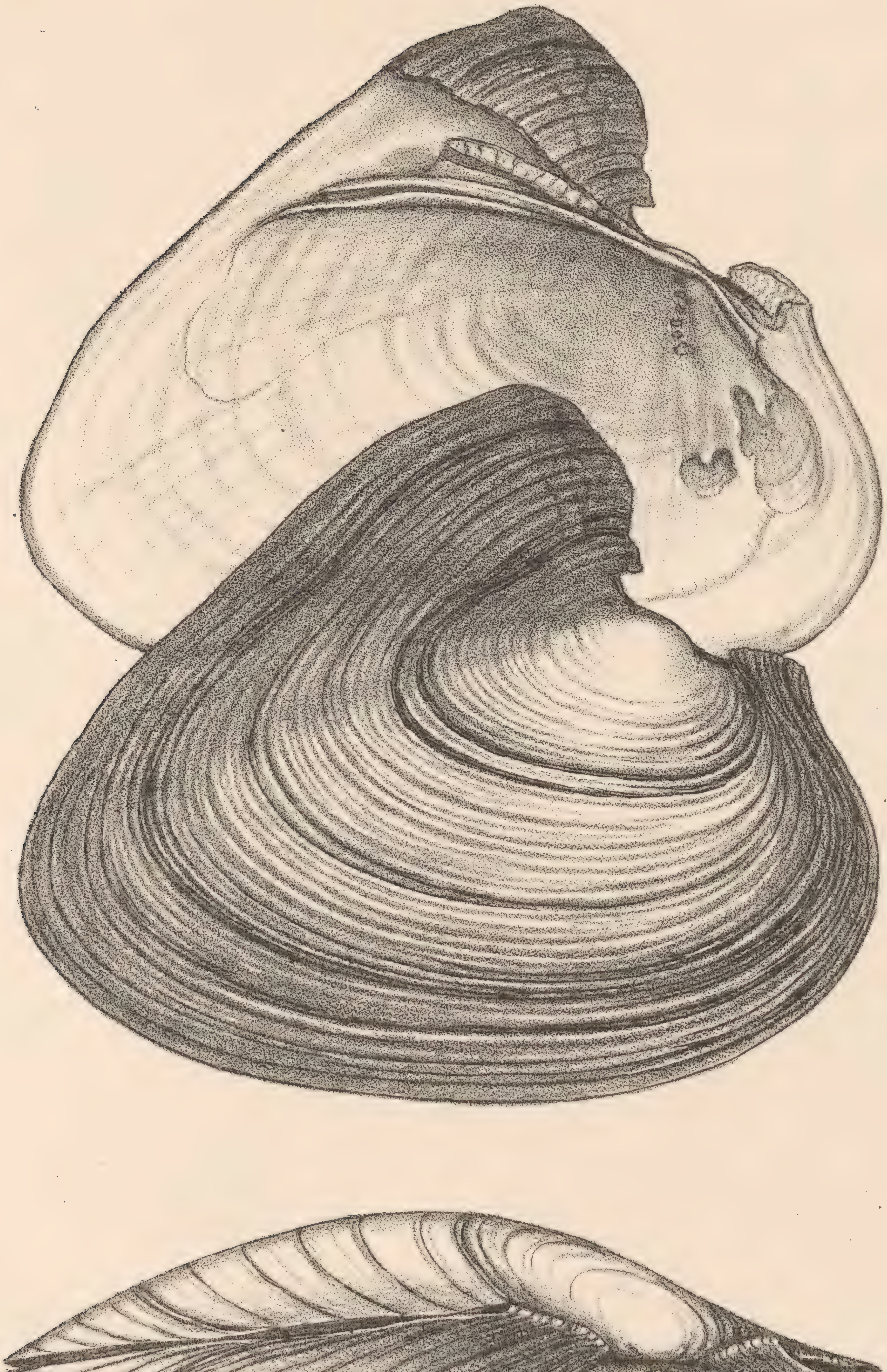
Unio obesus.

Unio cœruleus.

Drawn by J. Drayton.

Unio incurvus.

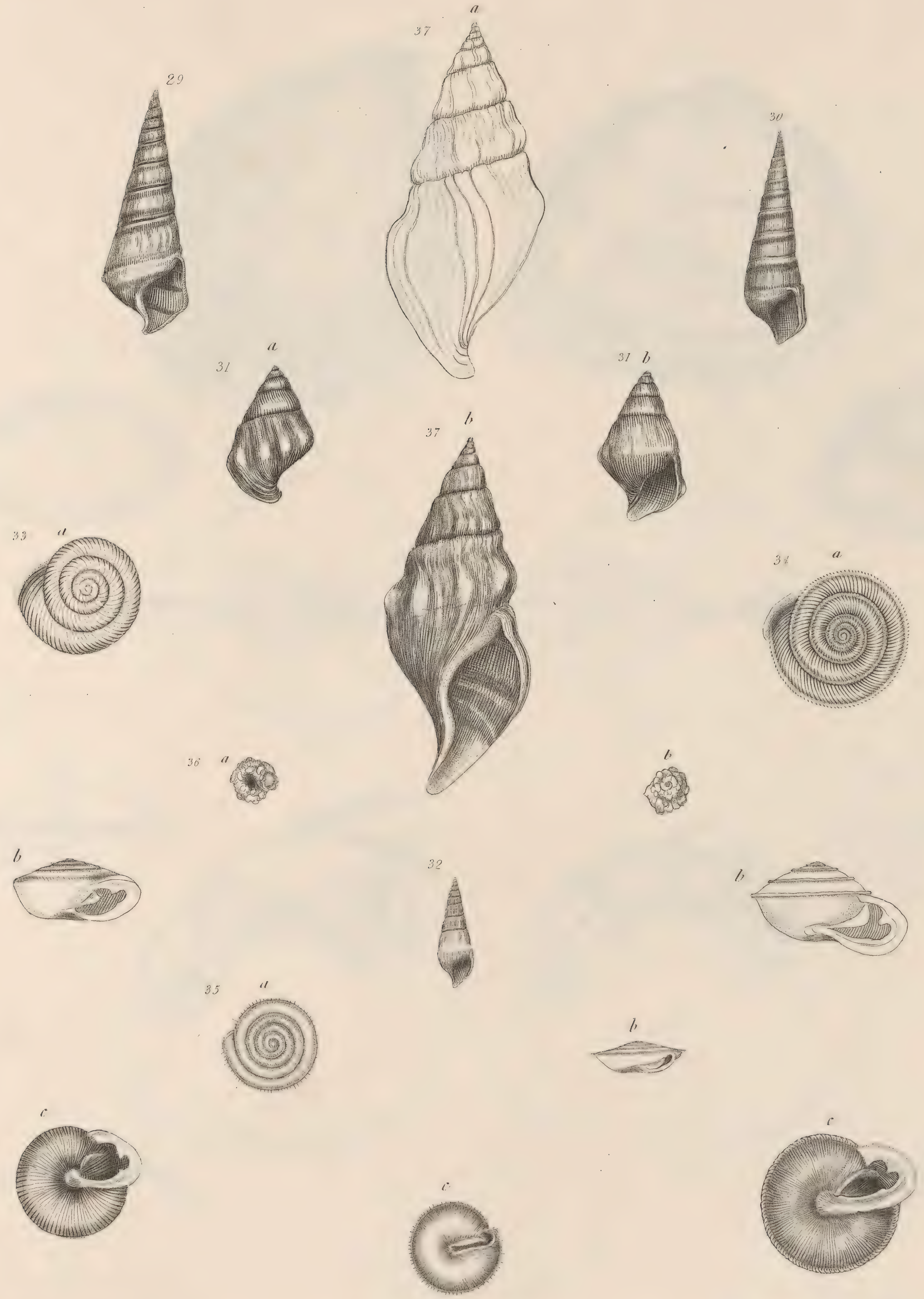
PL. XIV Vol. 4.



Symphynota inflata.

Drawn by J. Drayton.

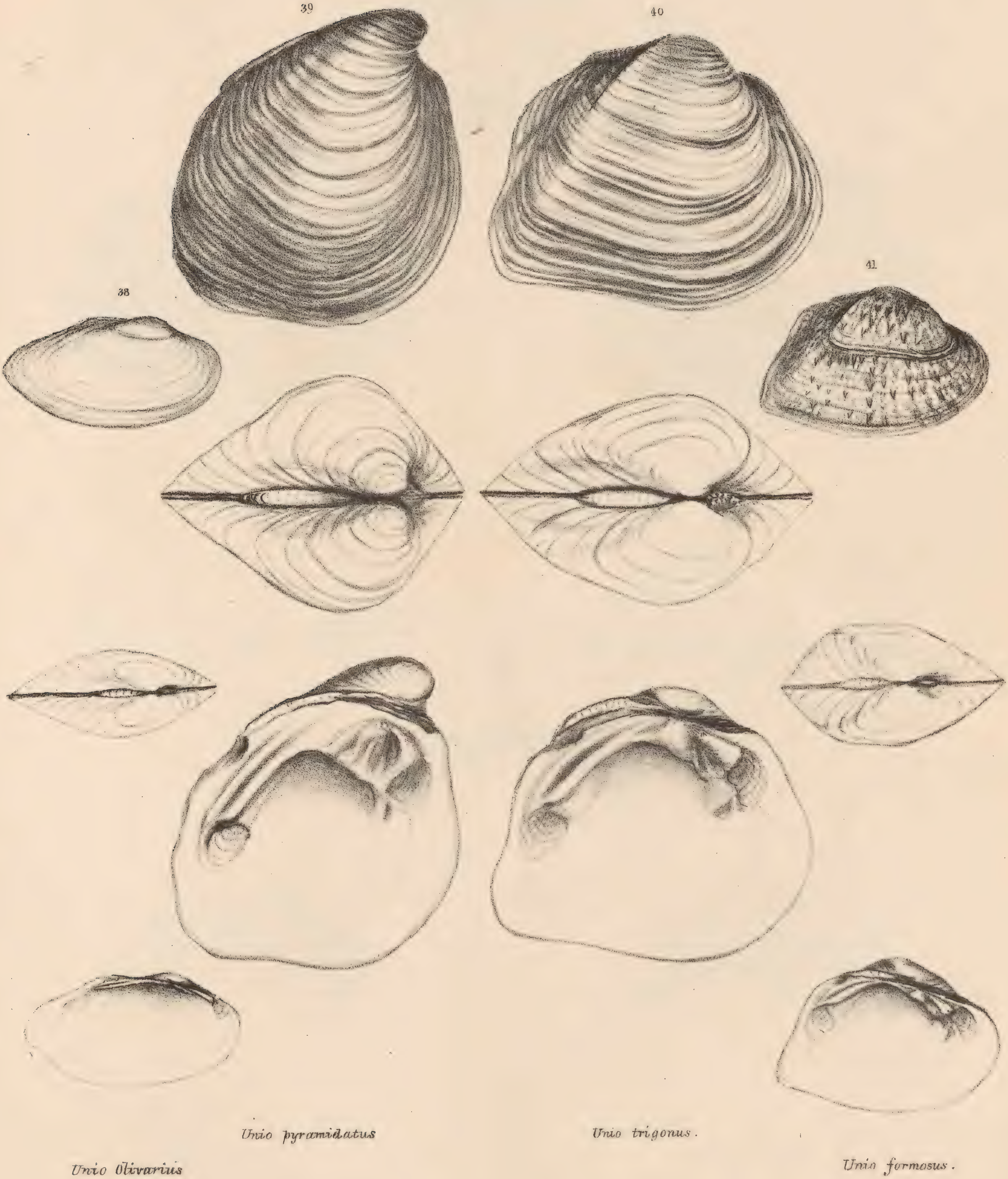
PL.XV. Vol.4.



Drawn & Eng.d by J. Drayton

29 . *Melania elongata* .
30 . *M.... subularis* ......
31 . *M.... tuberculata* ....
32 *Melania acuta* .....
33 *Helix caroliniensis* .
34 *Carocolla helicoides* .
35 *Carocolla spinosa* .
36 *Valvata arenifera* .
37 . *Io fusiformis* ......

PL.XVI Vol. 4.



Unio pyramidatus

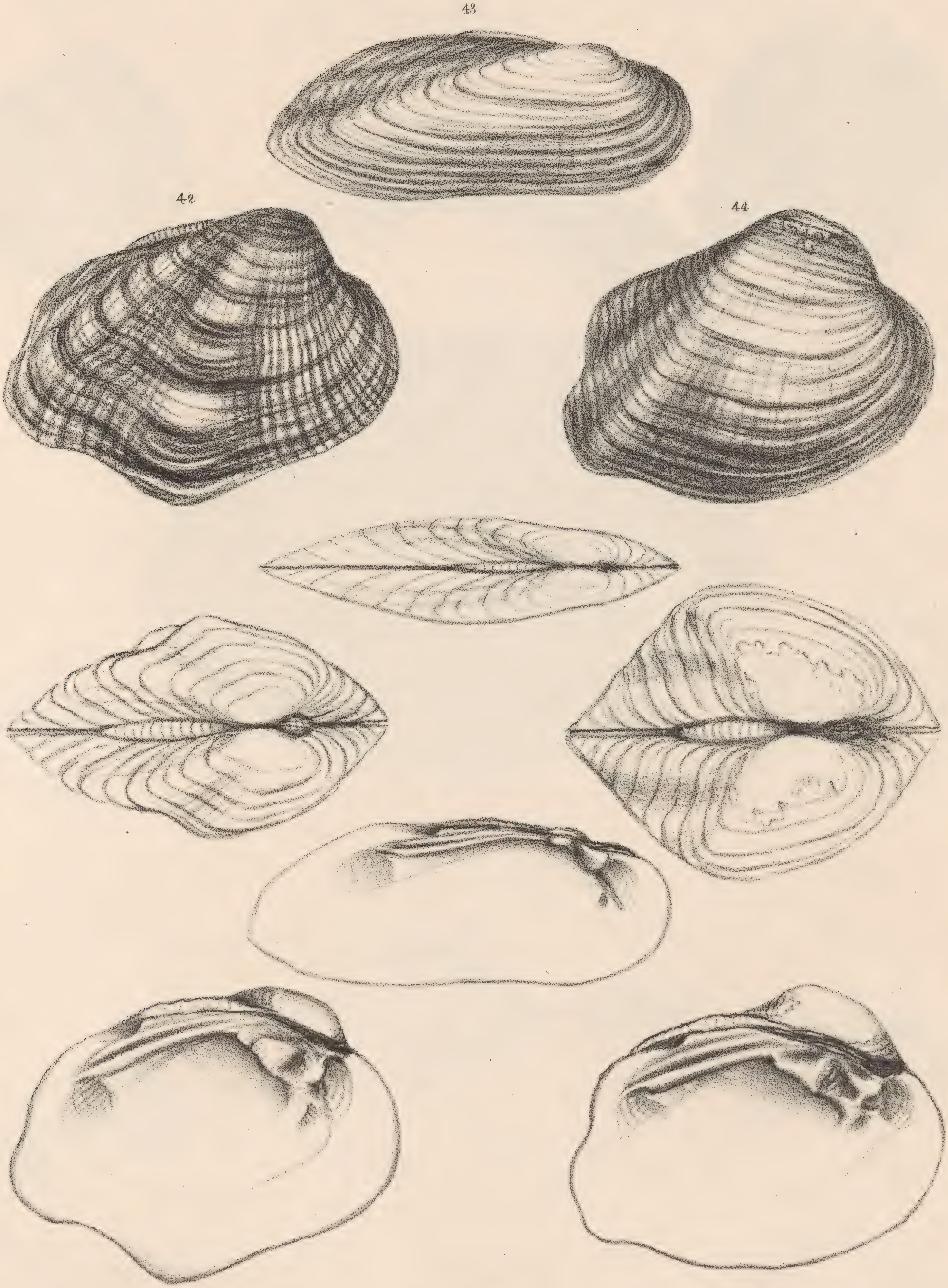
Unio trigonus.

Unio Olivarius

Unio formosus.

Drawn by J. Drayton.

PL. XVII Vol. 4.



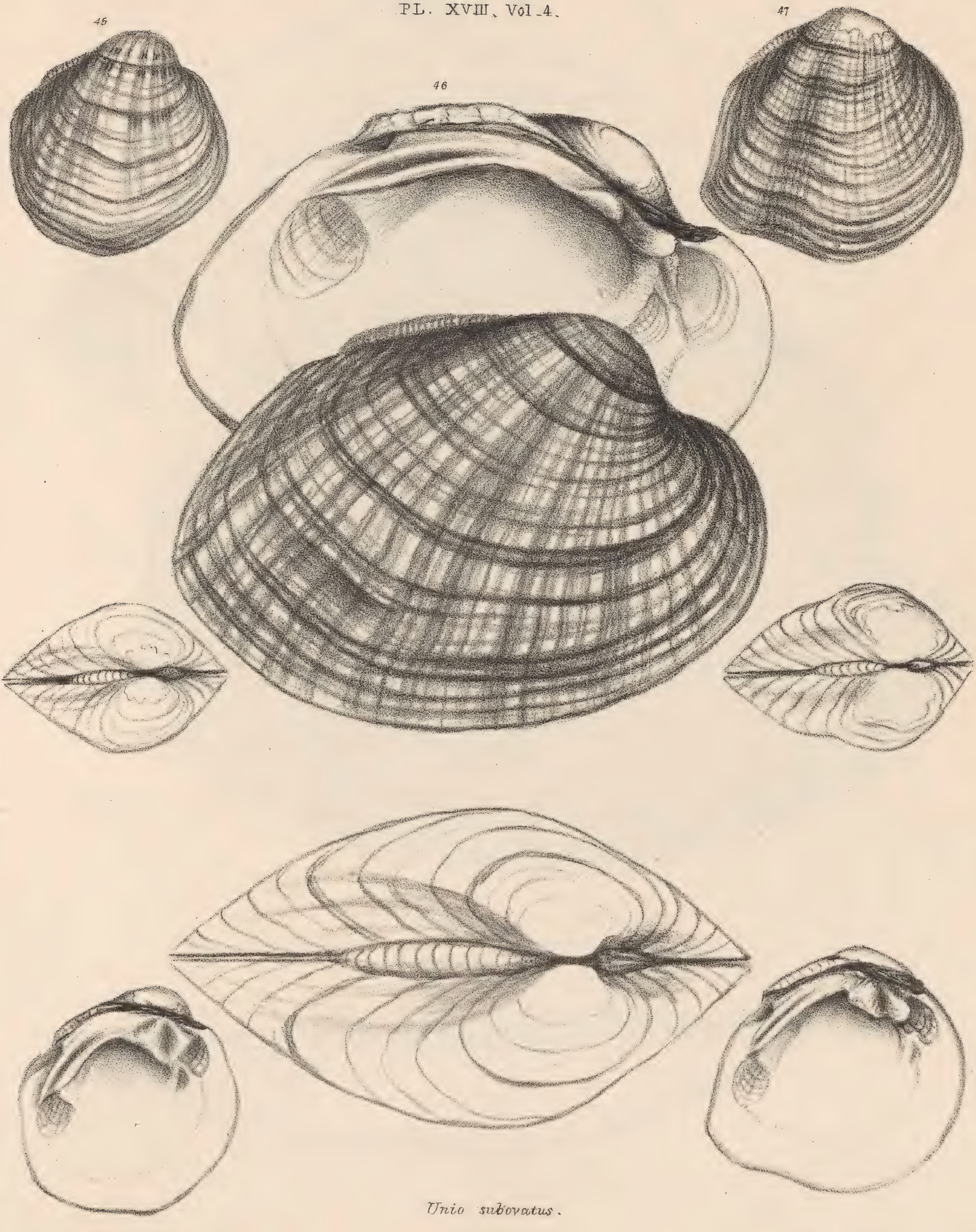
Unio angustatus

Unio perplexus,

Unio arcæformis

Drawn by J. Drayton

PL. XVIII. Vol. 4.



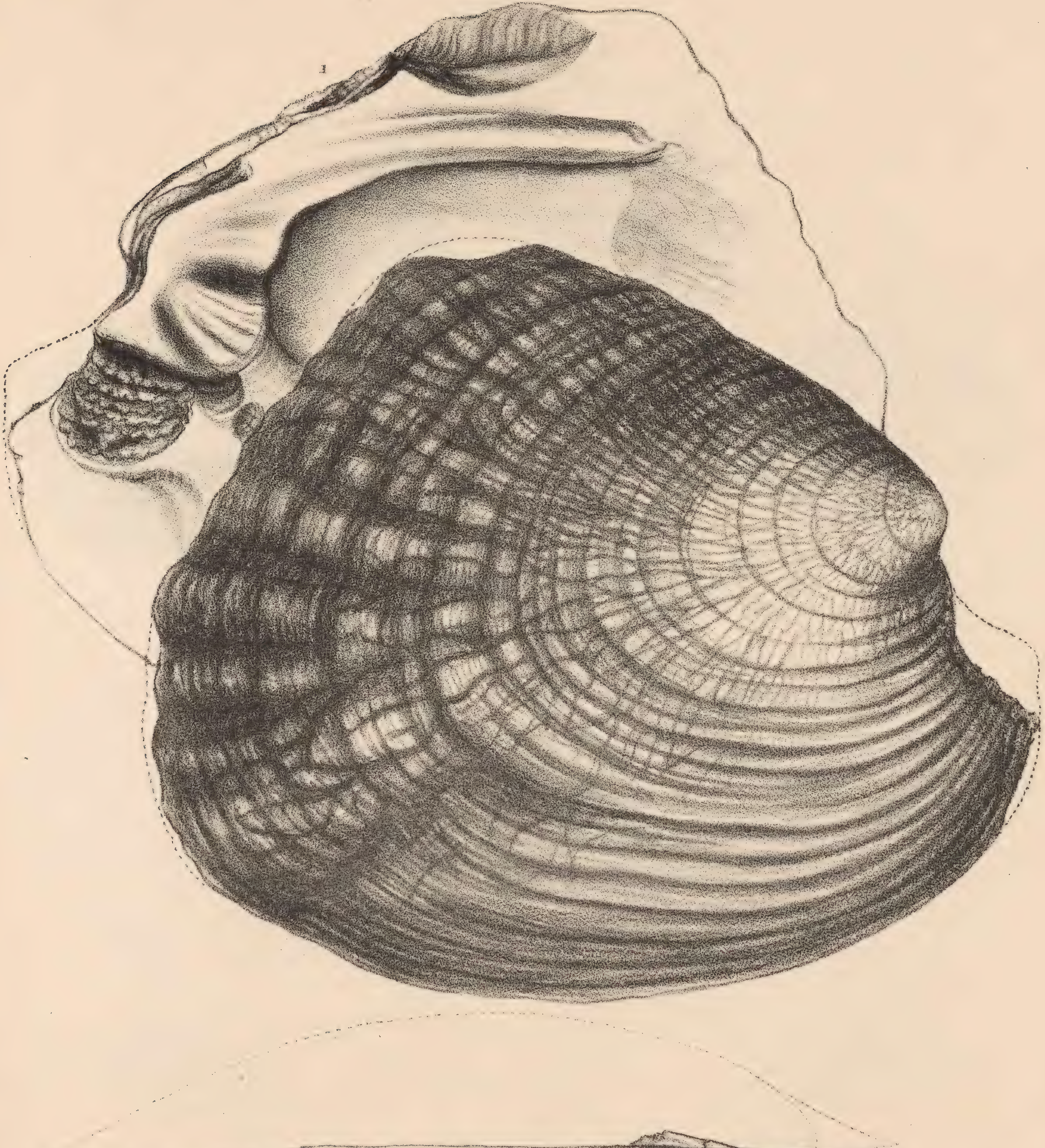
Unio subovatus.

Unio subrotundus.

Unio pileus.

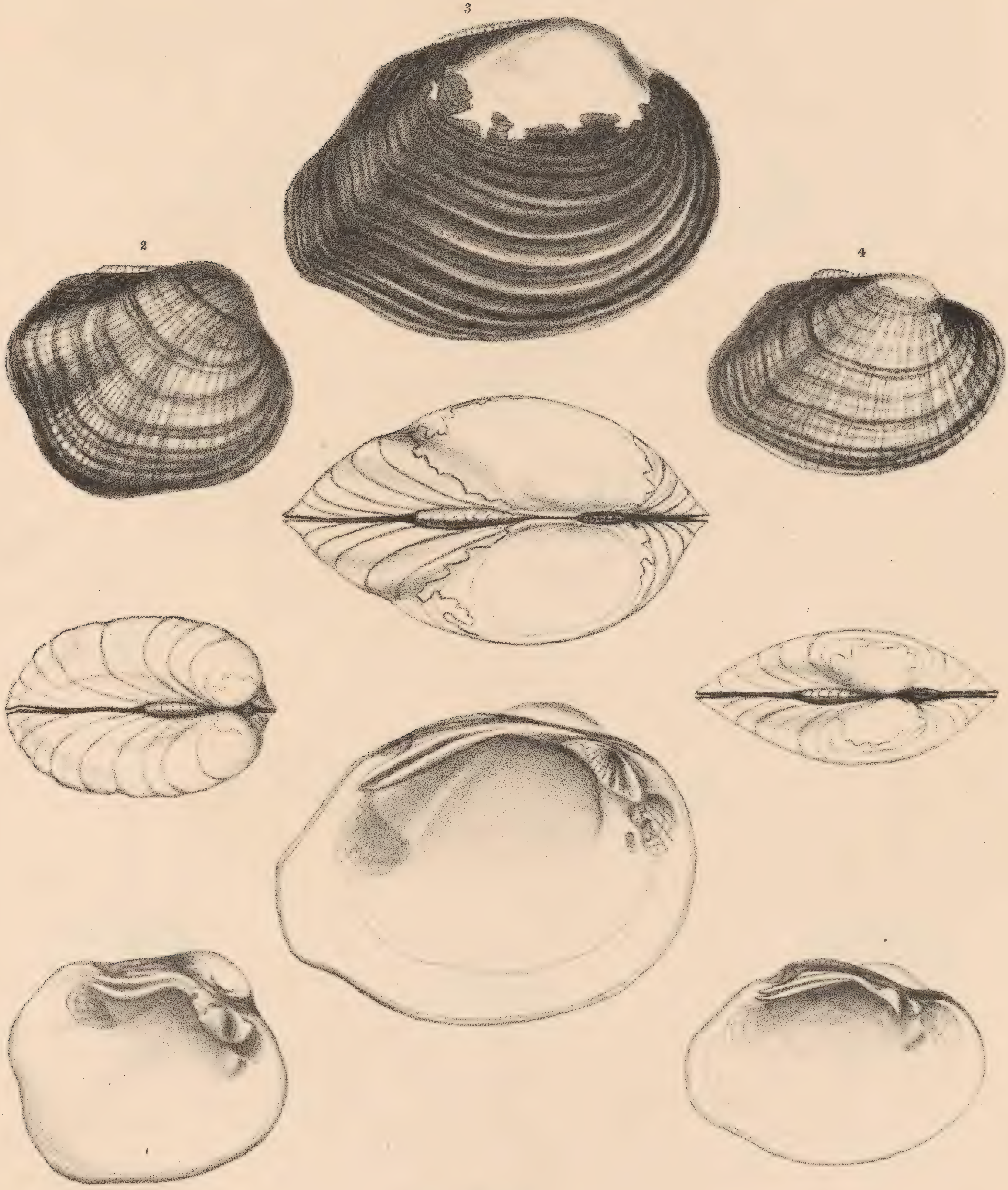
Drawn by J. Drayton

PL. I Vol. 5.



Drawn by J. Drayton

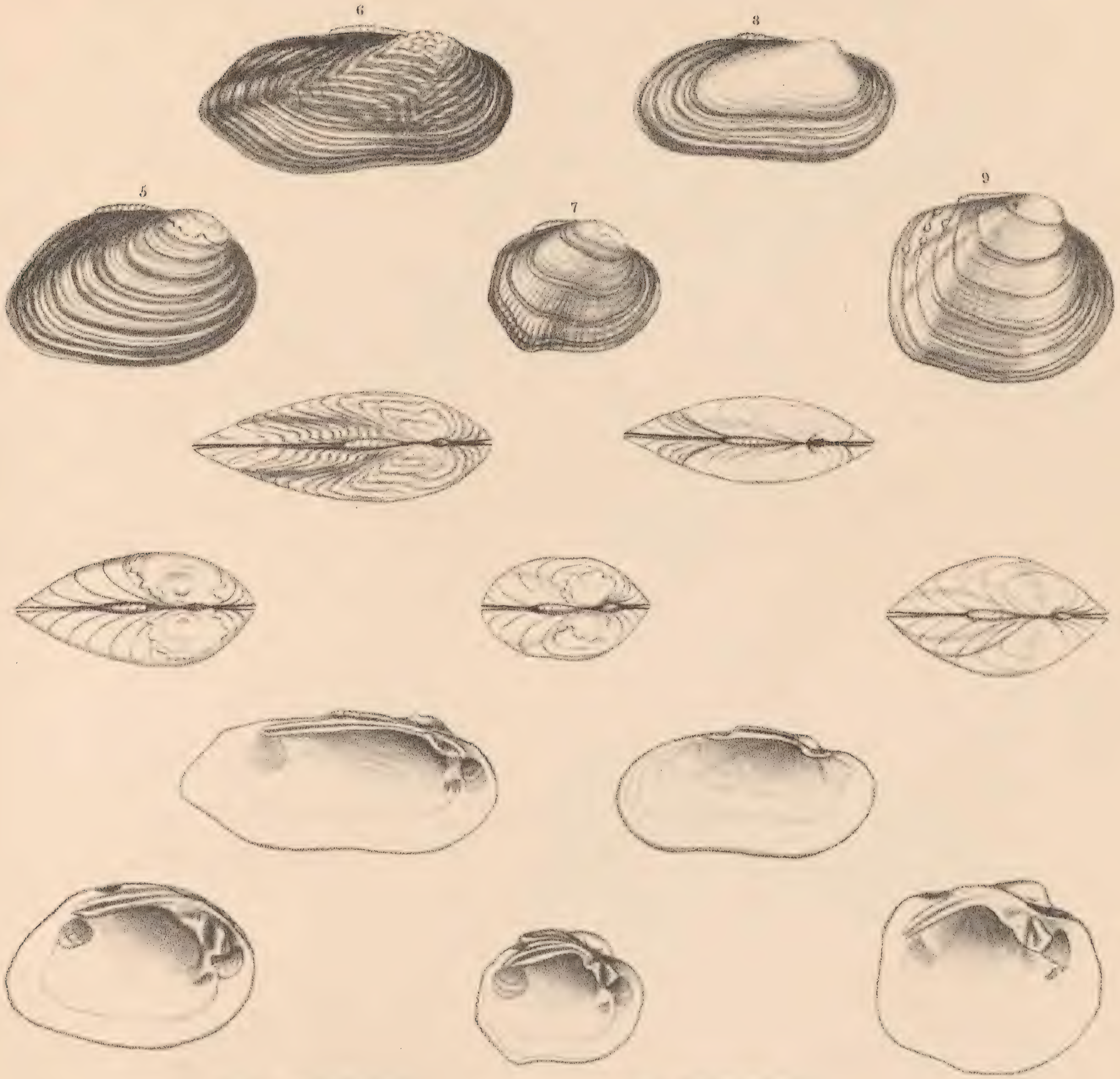
Unio Nicklinianus



Unio capillaris. *Unio subglobosus.* *Unio capsæformis.*

Drawn by J. Drayton.

PL. III Vol. 5.

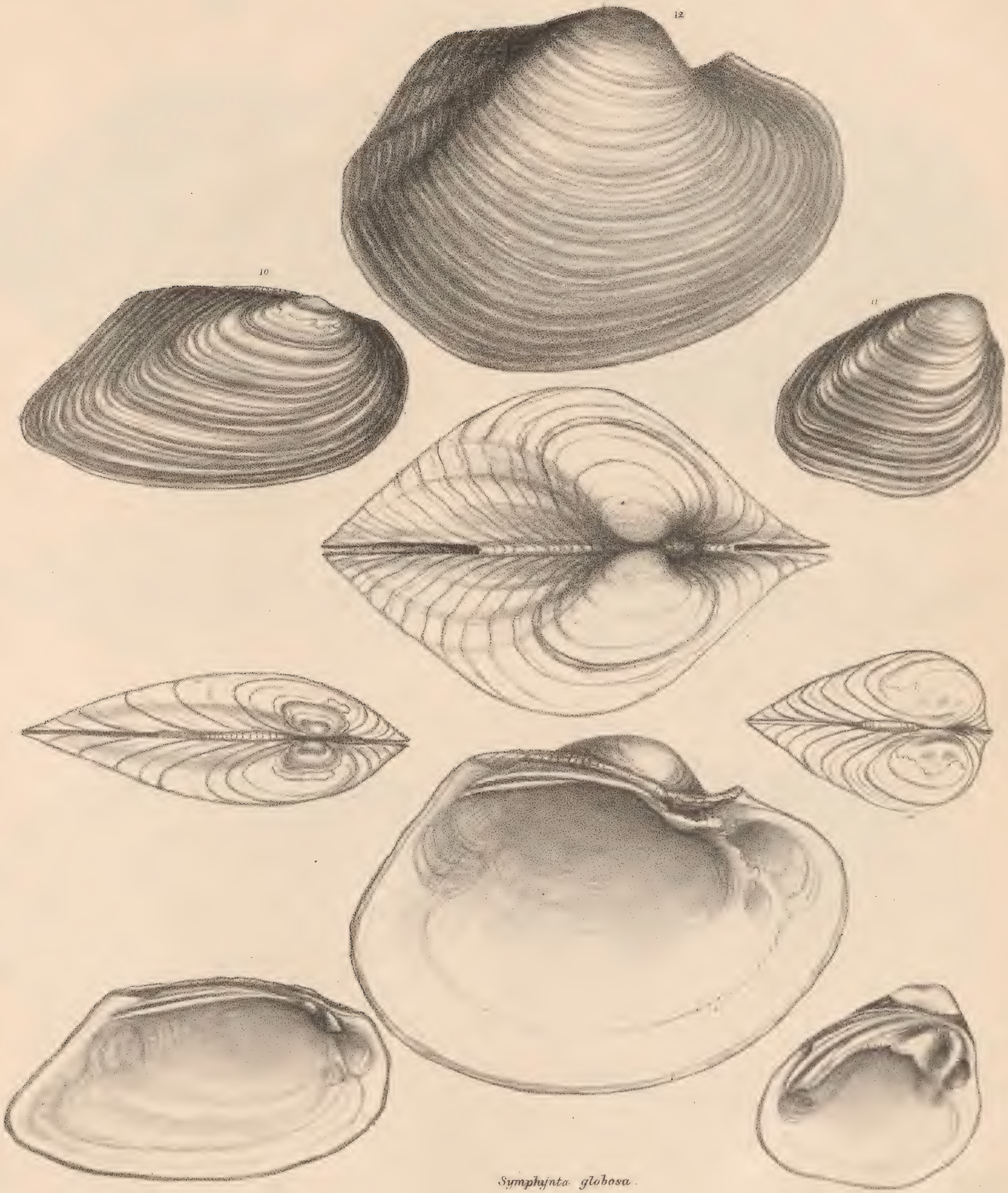


Unio Murchisonianus. *Unio Hildrethianus.*

Unio Ravenelianus. *Unio Haysianus.* *Unio Schoolcraftensis.*

Drawn by J. Drayton

PL. IV Vol 5.



Symphynta globosa.

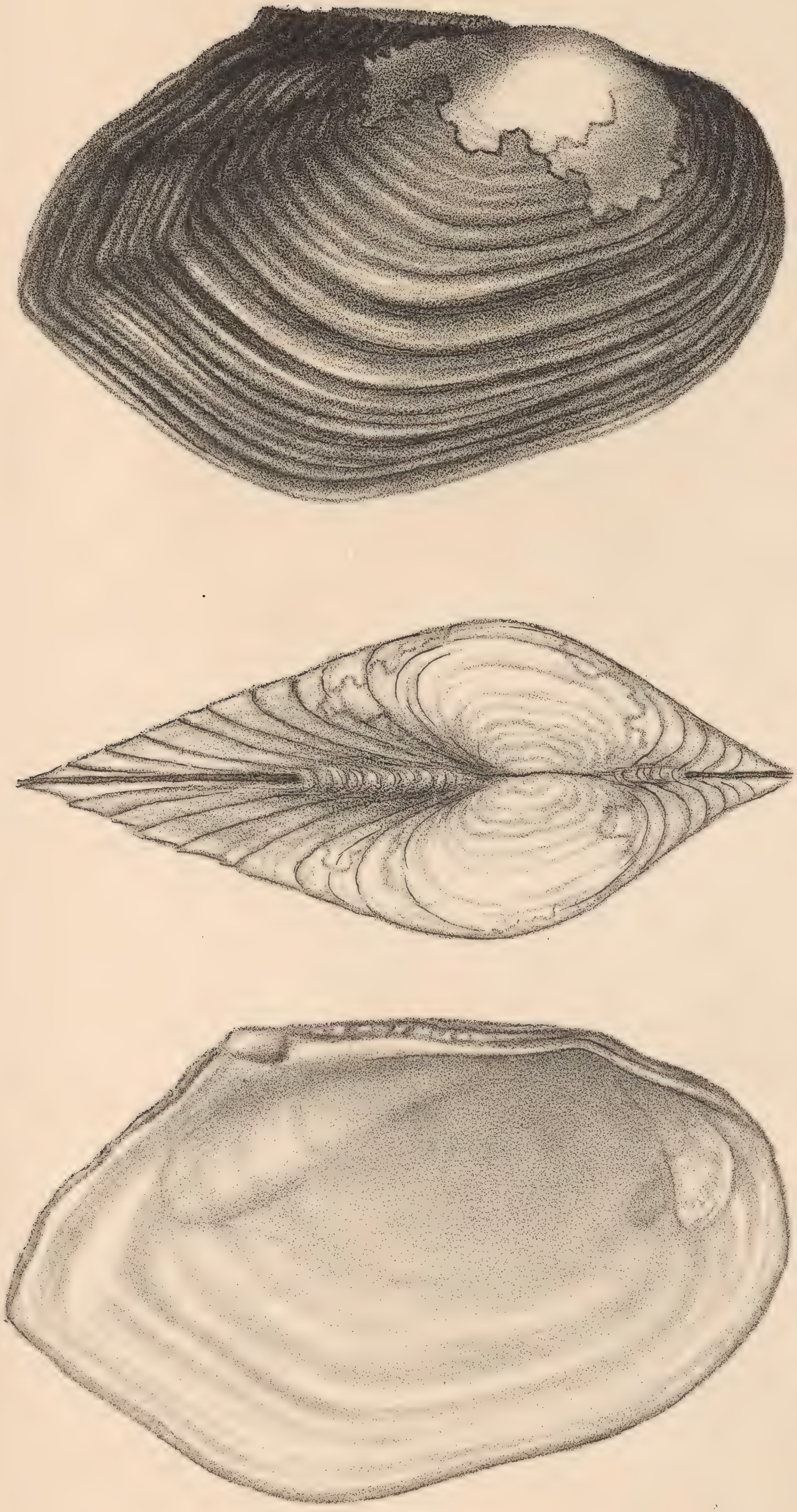
Unio geometricus

Unio Taitianus.

Drawn by J. Drayton.

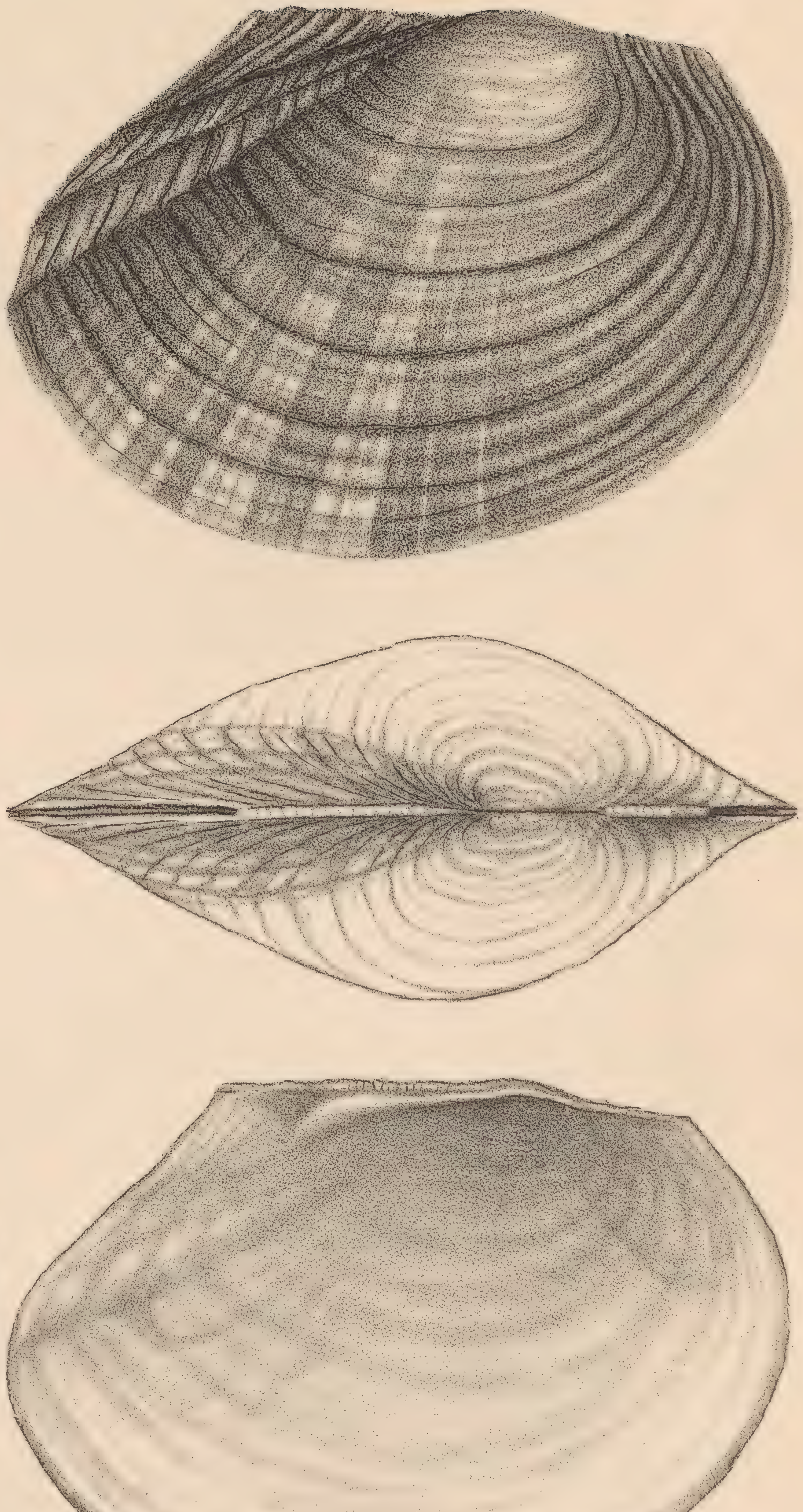
PL. V. Vol. 5.

13



Symphynota Woodiana.

14

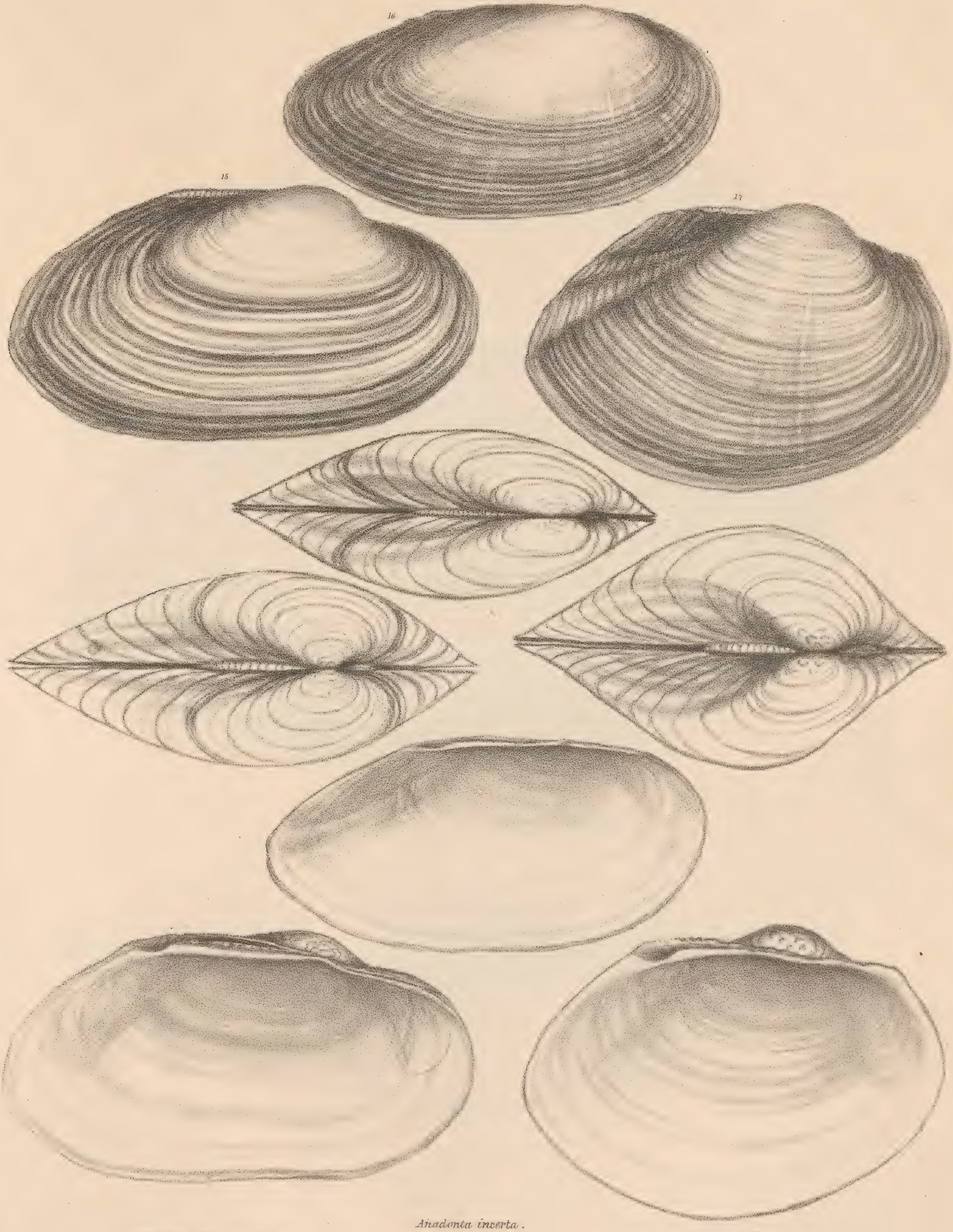


Symphynota magnifica.

Brown's Lith.

Drawn by J. Drayton.

PL. VI Vol. 5.



Anadonta incerta.

Anadonta Ferussaciana.

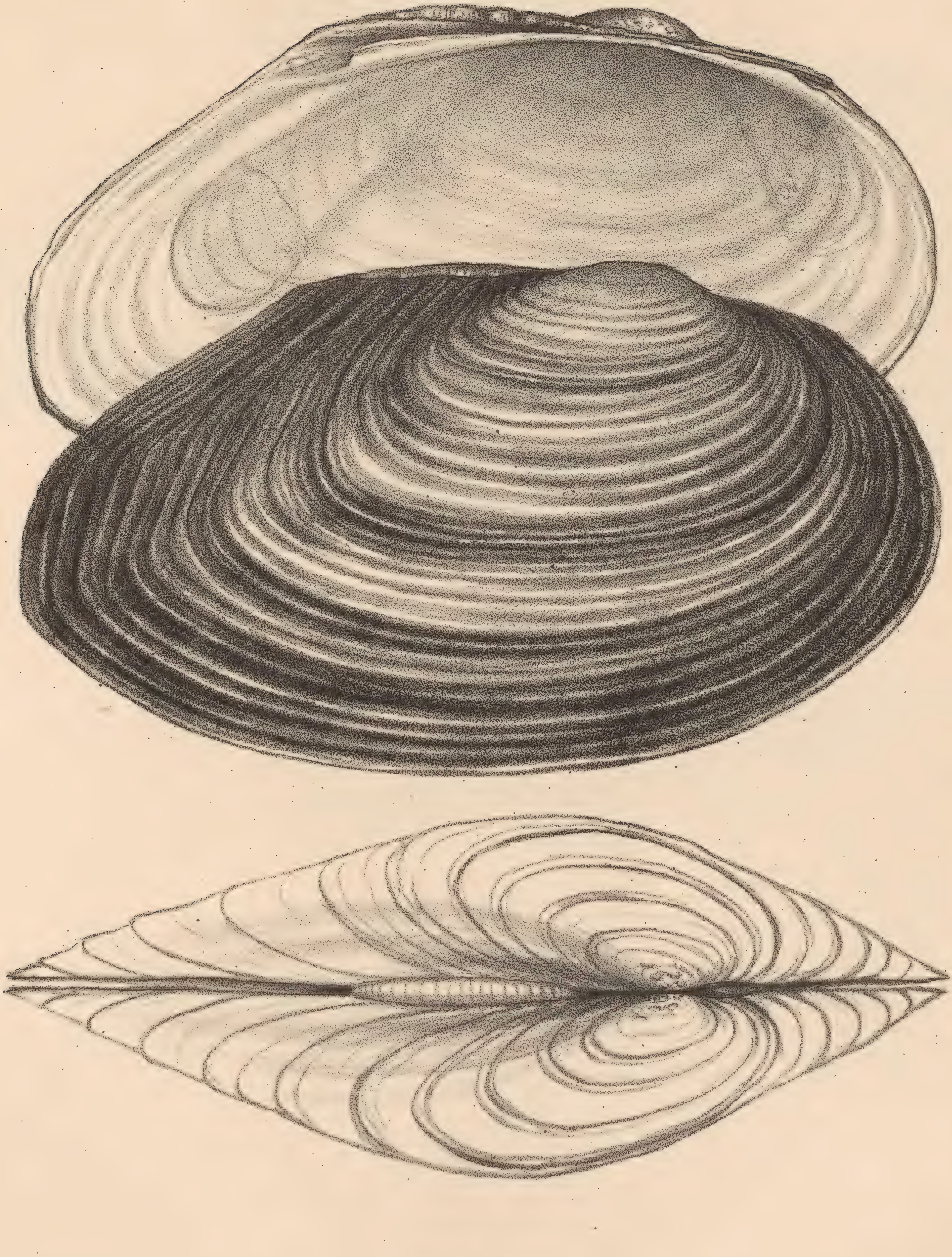
Anadonta Stewartiana.

Drawn on stone by J. Drayton.

Lith by M. E D. Brown.

P.L. VII Vol. 5.

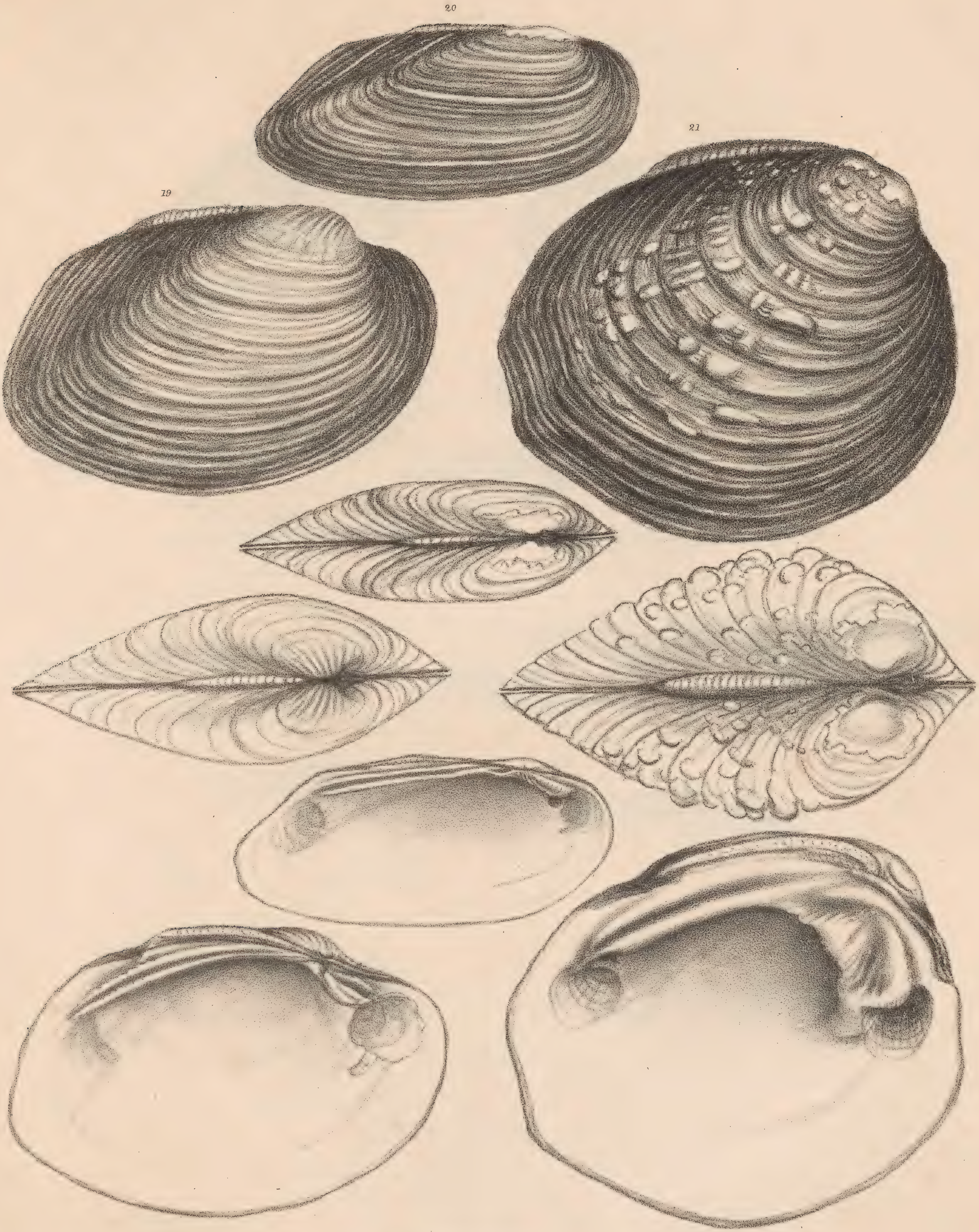
18



Anadonta plana.

Brown's Lith. *Drawn by J. Drayton.*

PL. VIII Vol. 5.



Unio parallelopipedon.

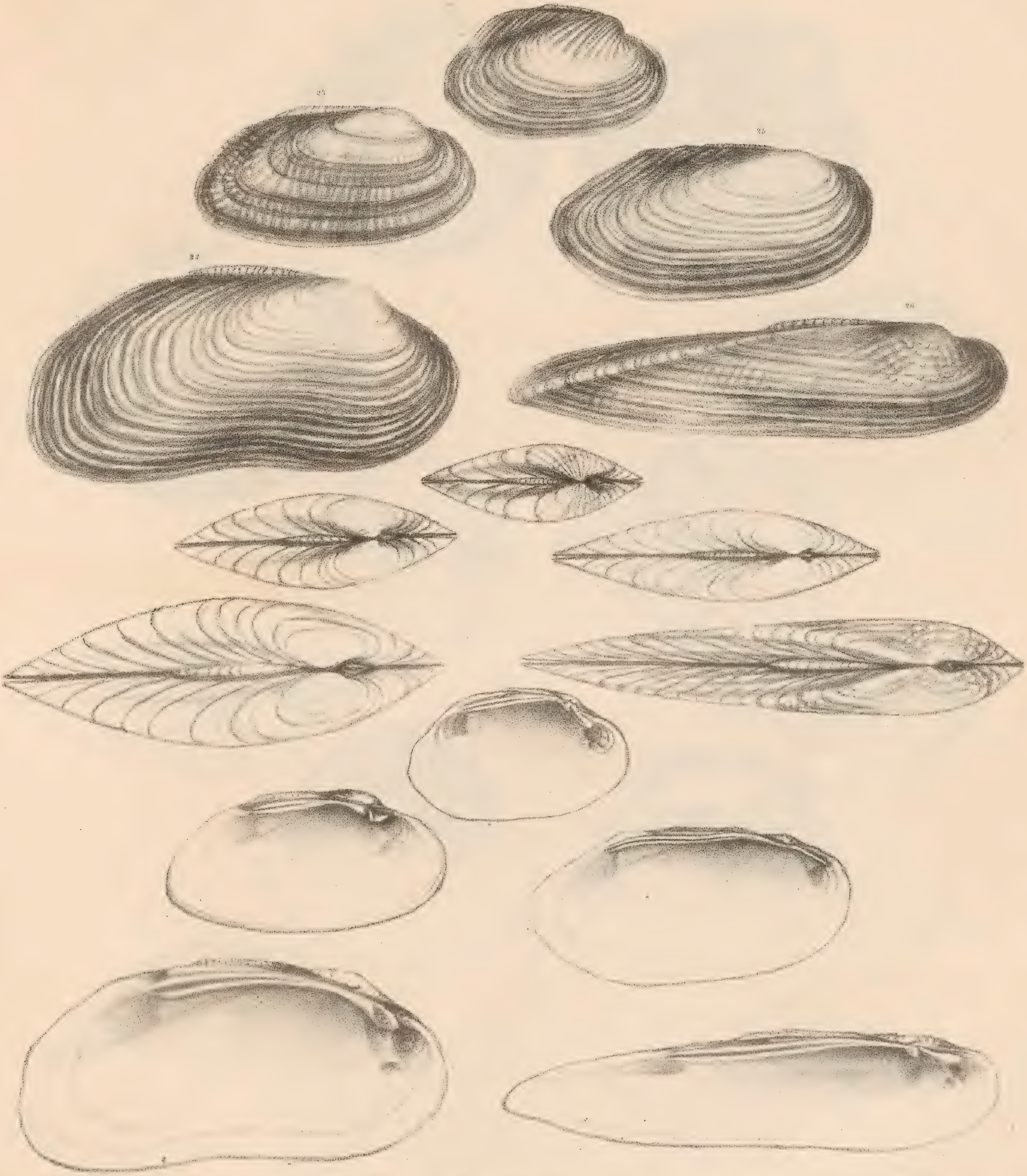
Unio lacteolus.

Unio Cooperianus.

Drawn on stone by J. Drayton.

Brown's Lith.

PL. IX Vol. 5.

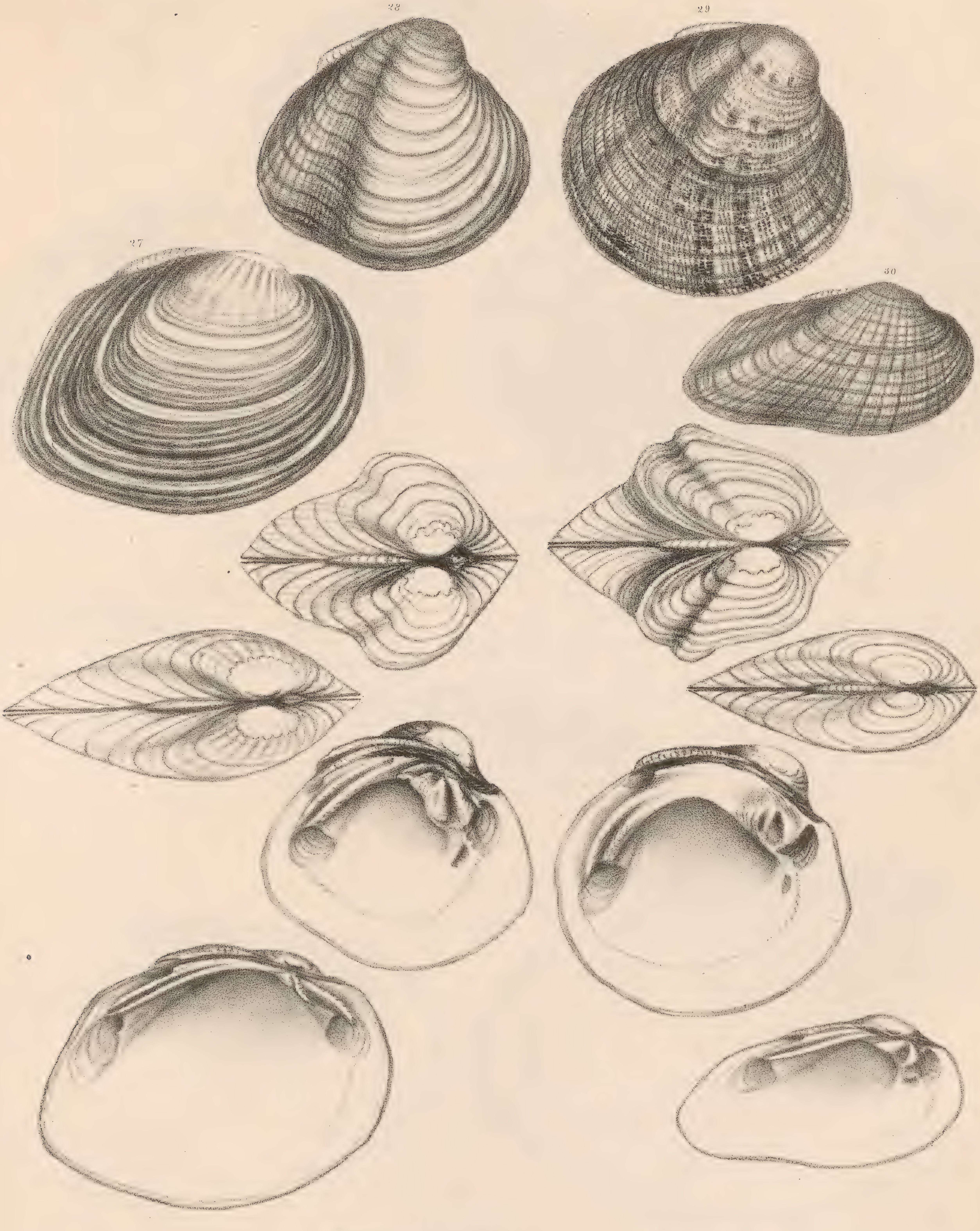


Unio emarginatus. *Unio divaricatus.* *Unio Grayanus.*

Unio Conradicus. *Unio Corrianus.*

Drawn on stone by J. Drayton [illegible] Lith.

PL. X Vol. 5.

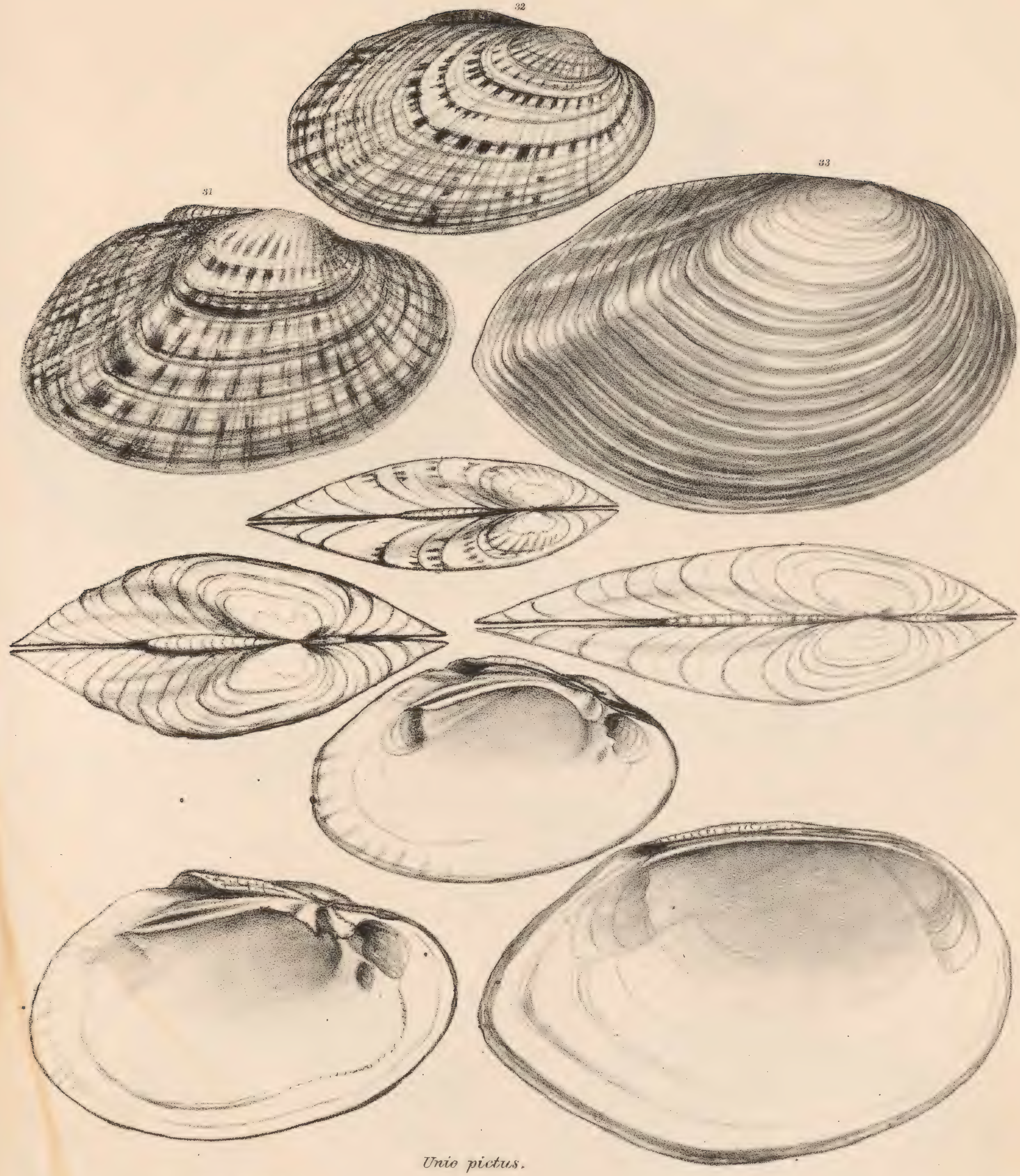


Unio Sowerbianus. *Unio dromas.*

Unio Burroughianus. *Unio Troostensis.*

Drawn by J. Drayton. *Brown's Lith.*

PL. XI Vol.5.



Unio pictus.

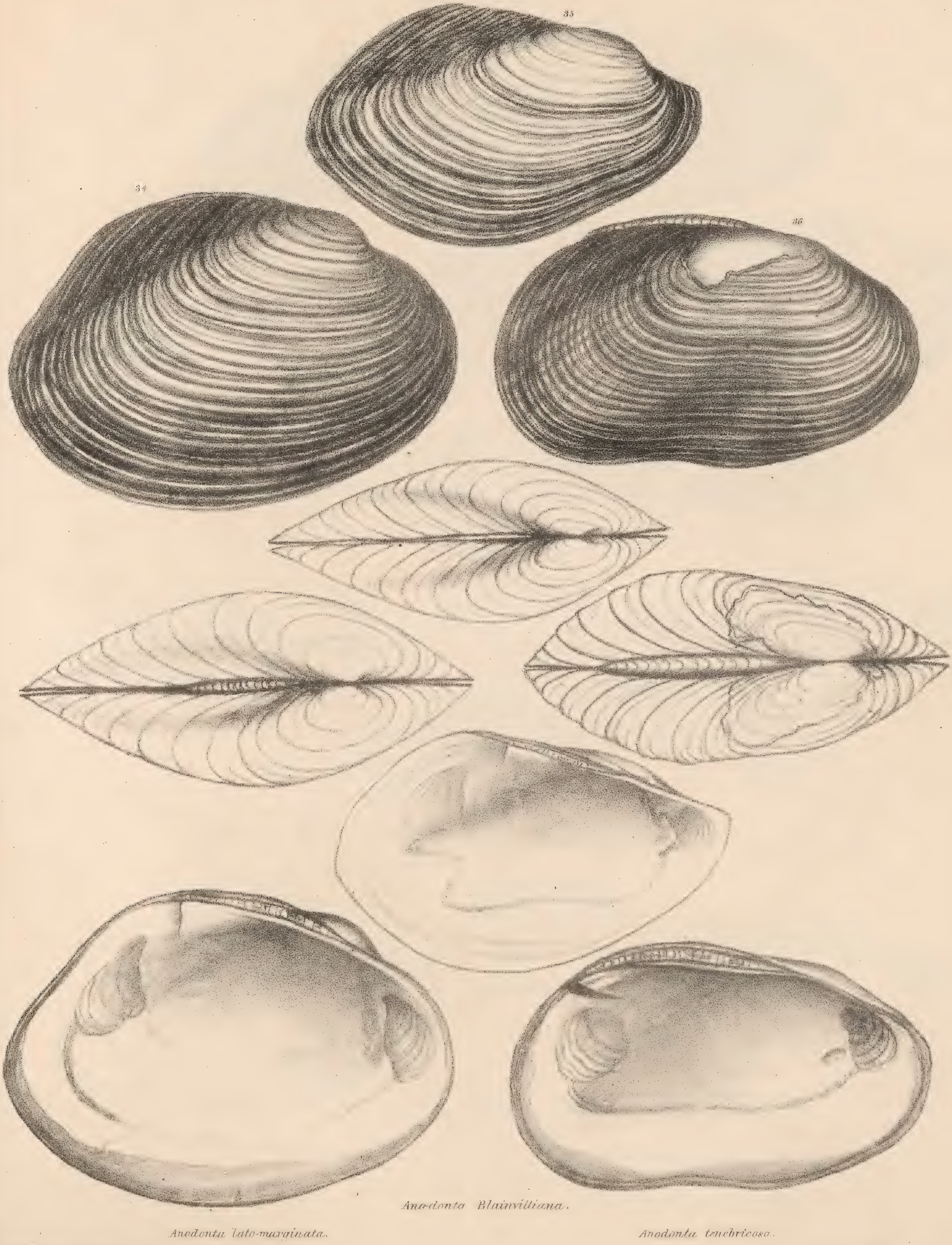
Unio perdix.

Symphynota discoidea.

Drawn by J. Drayton.

Brown's Lith.

PL. XII Vol. 5.



Anodonta Blainvilliana.

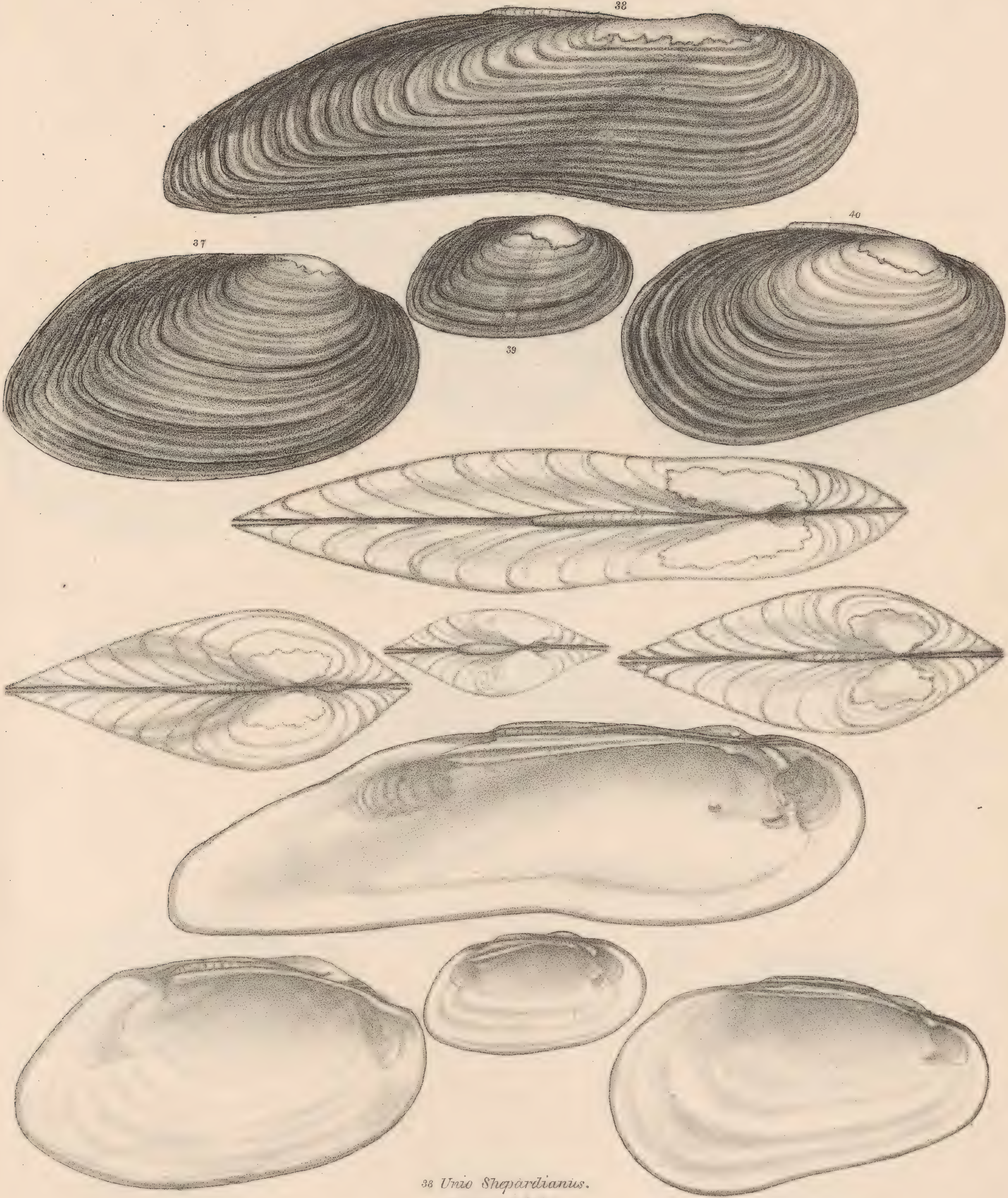
Anodonta lato-marginata.

Anodonta tenebricosa.

Drawn by J. Drayton.

Brown's Lith.

PL. XIII Vol. 5.



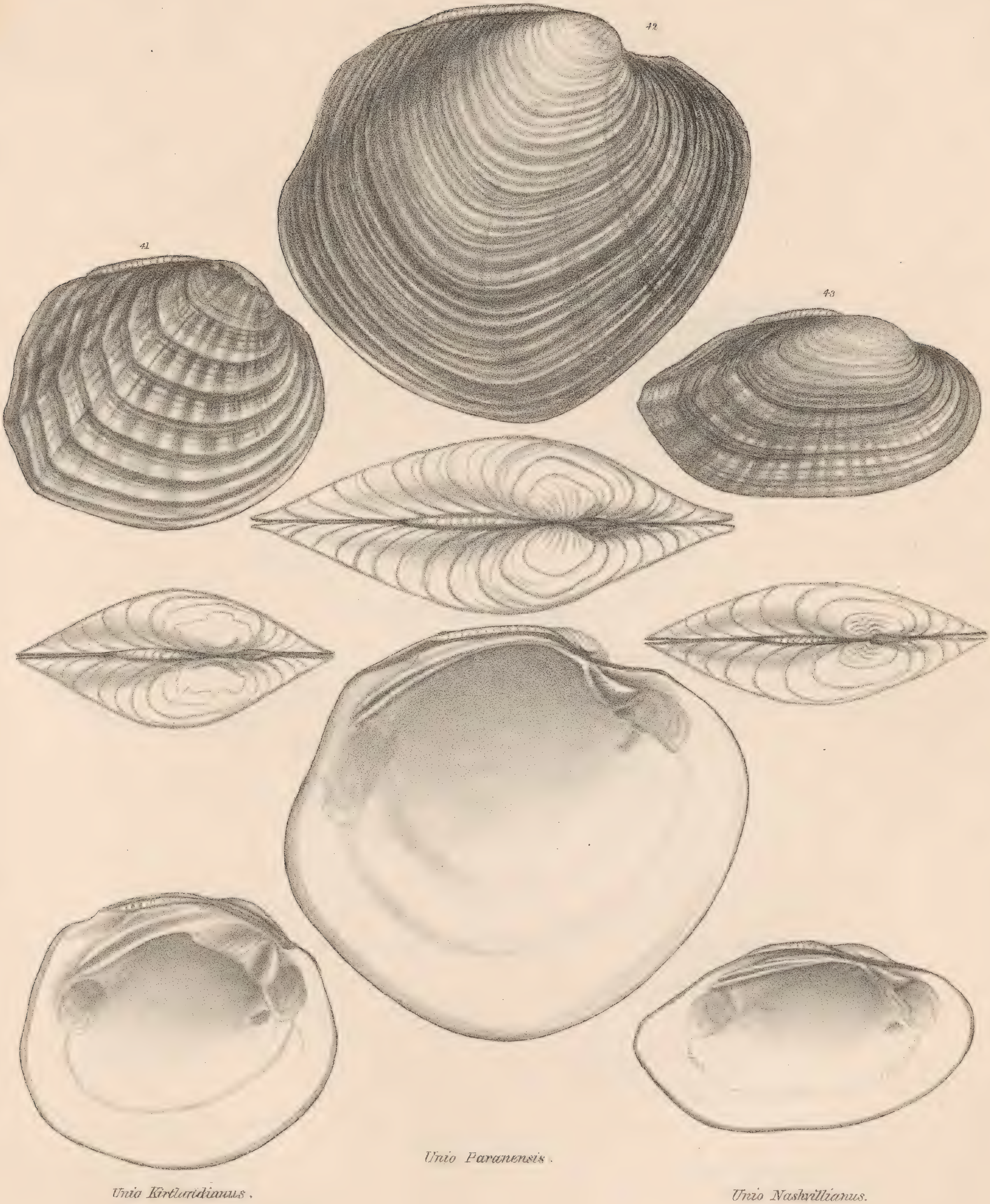
38 *Unio Shepardianus.*
39 *Unio fulvus.*

Anodonta Mortoniana.

Unio modiolaformis.

Drawn by J. Drayton.

PL. XIV Vol. 5.



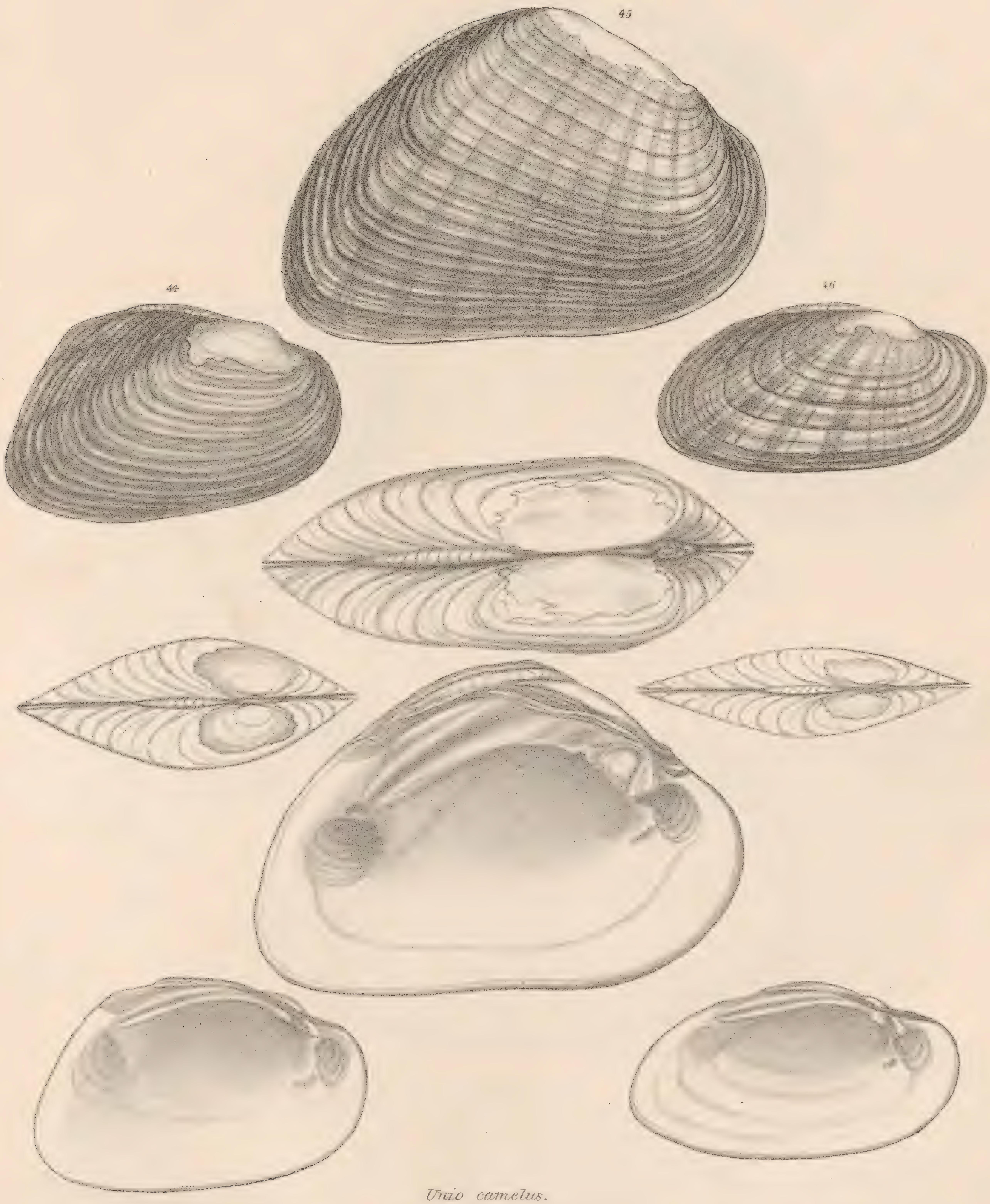
Unio Paranensis.

Unio Kirtlandianus.

Unio Nashvillianus.

Drawn by J. Drayton.

PL. XV Vol. 5.



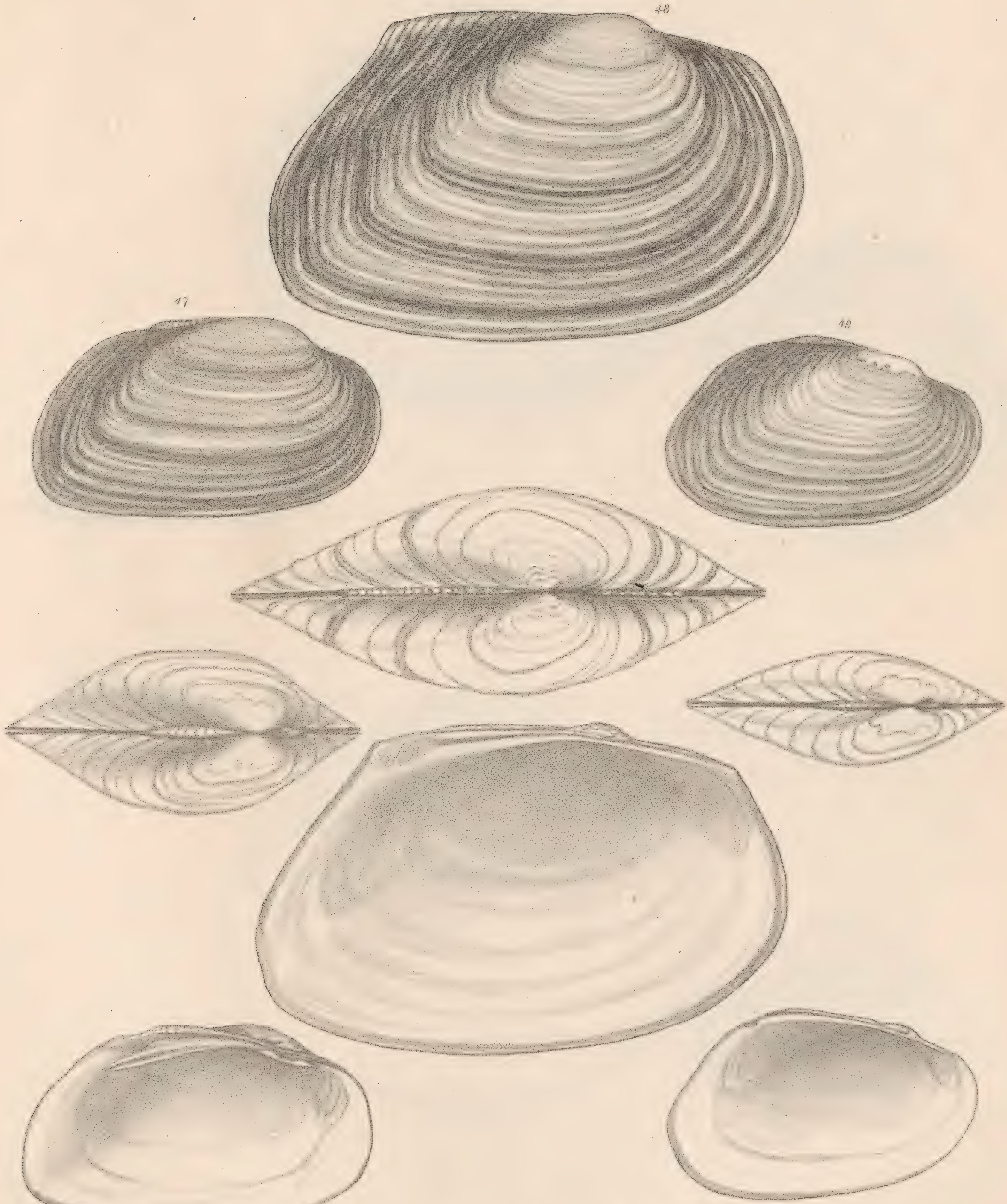
Unio camelus.

Unio Blandingianus.

Unio Griffithianus.

Drawn by J. Drayton.

PL. XVI Vol. 5.

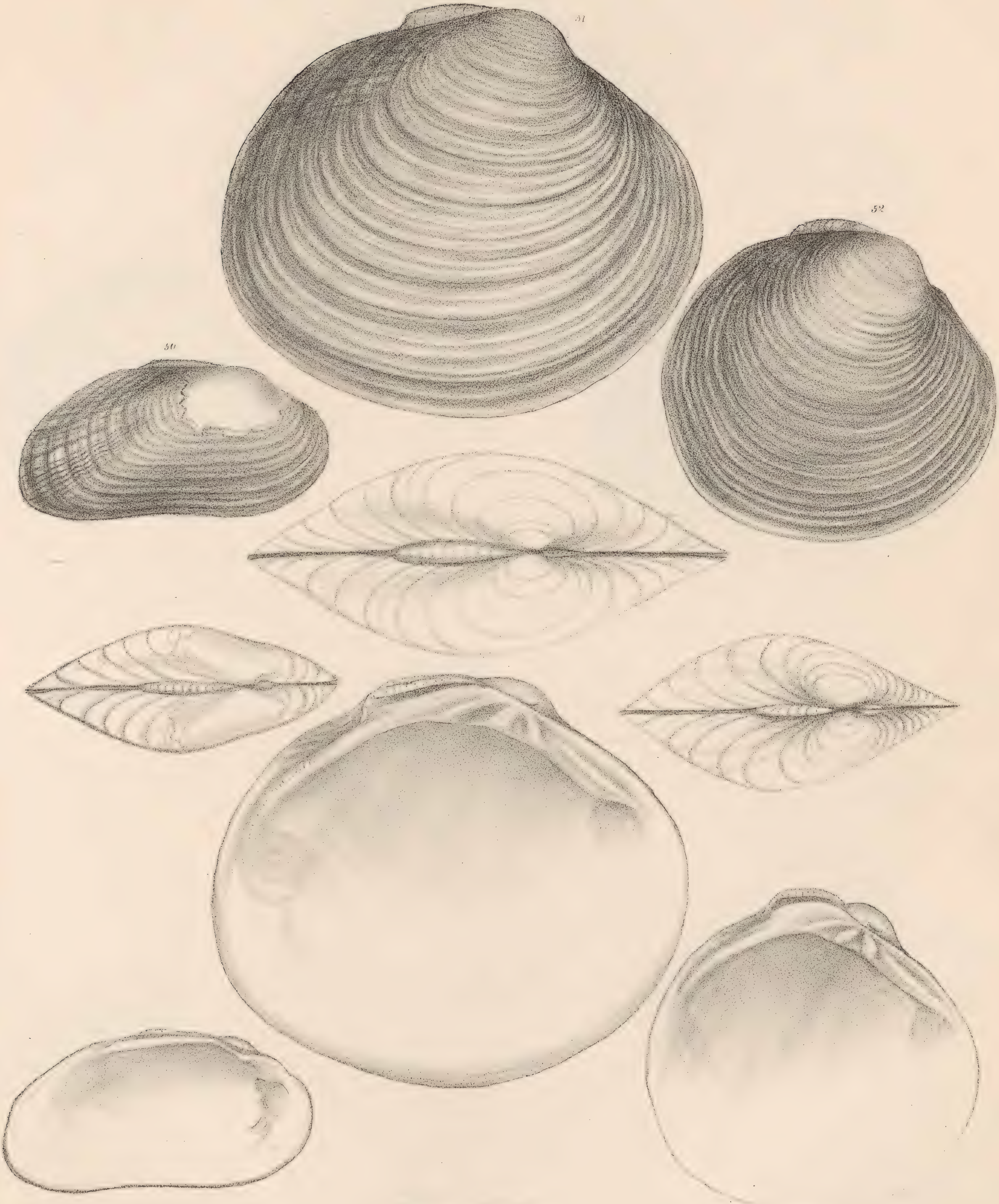


Symphynota Benedictensis

Unio confertus.

Anodonta Burroughiana.

Drawn by J. Drayton.

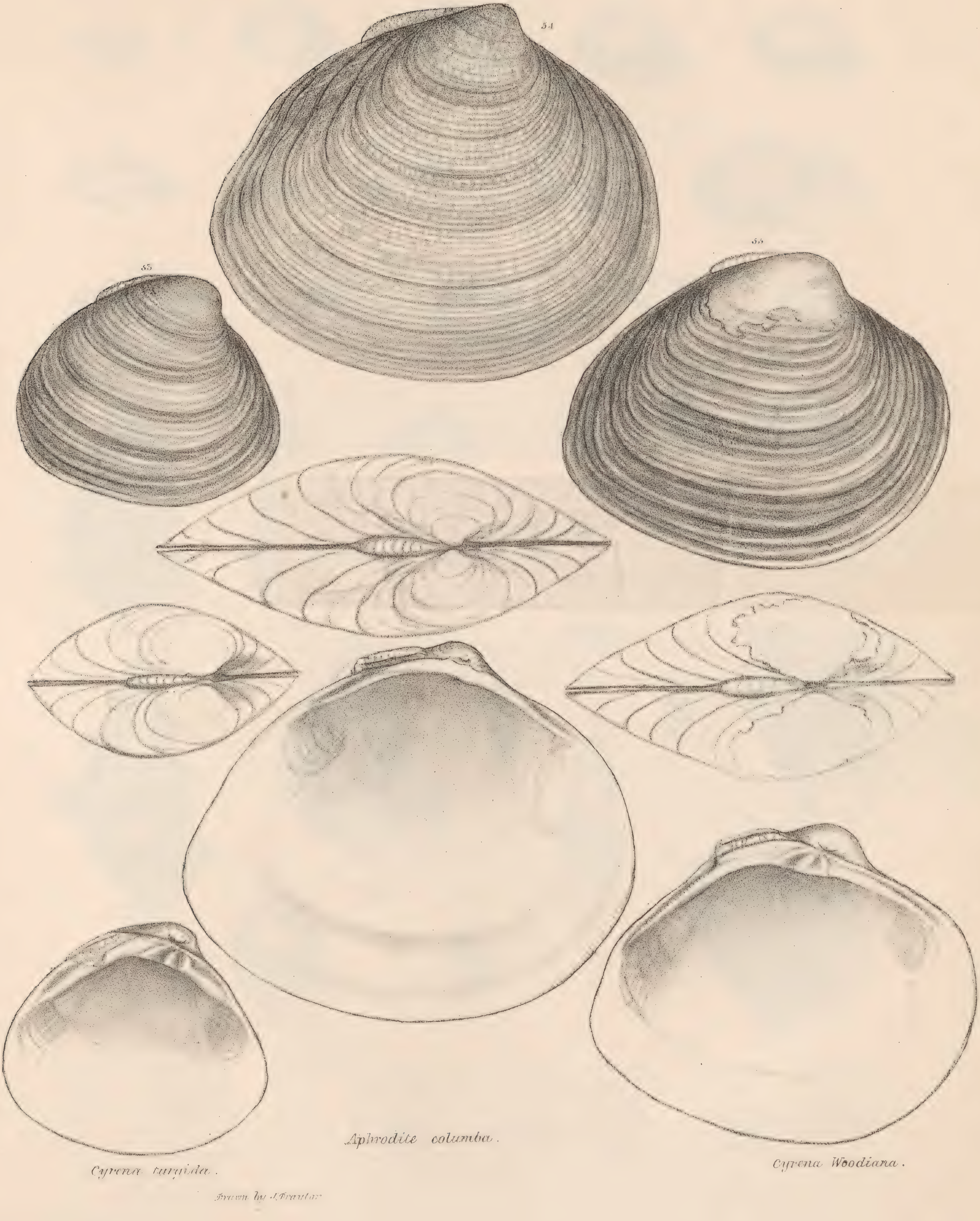


Cyrena rotundata.

Margaritana Raveneliana.

Cyrena [illegible]

Drawn by J. Drayton.



Aphrodite columba.

Cyrena turgida.

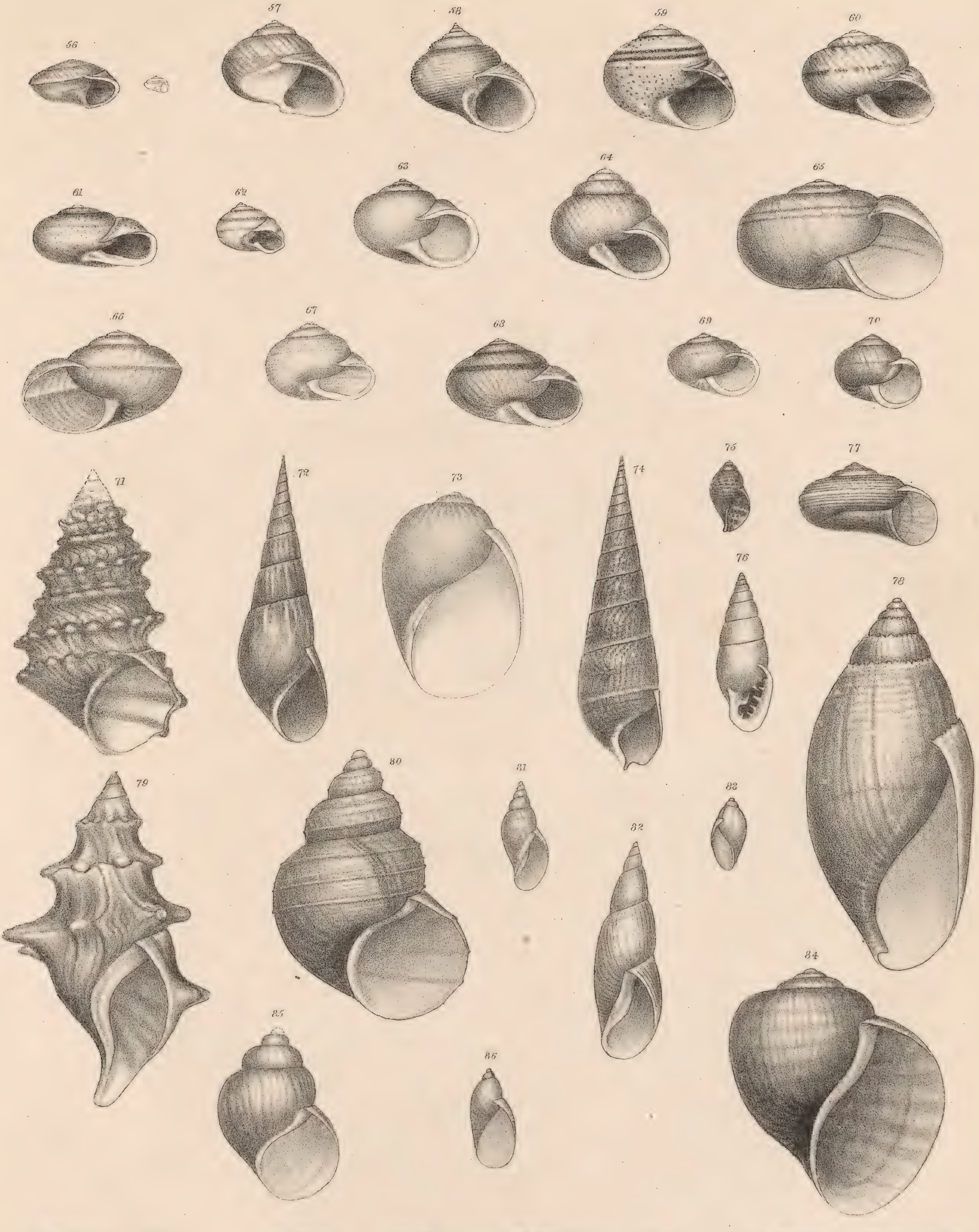
Cyrena Woodiana.

Drawn by J. Frautar

ISAAC LEA

"Observations on the Genus *Unio* . . ." (Philadelphia, 1834).

PL. XIX, Vol. 5



56 *Helicina* .... *lens*
57 ,, ... *pulcherrima*
58 ,, ... *virginea*
59 *Helix* ...... *muscarum*
60 ,, ... *purpuragula*
61 ,, ... *ovum reguli*
62 ,, ... *monodonta*
63 ,, ... *cyclostomopsis*

64 *Helix* ...... *mamilla*
65 ,, ... *diaphana*
66 ,, ... *Himalana*
67 ,, ... *vesica*
68 ,, ... *cincta*
69 ,, ... *Woodiana*
70 ,, ... *globula*
71 *Paludina* ... *bi-monilifera*

72 *Melania* .... *aculeus*
73 *Lymnæa* .... *imperialis*
74 *Melanopsis* ... *princeps*
75 ,, ... *maculata*
76 *Auricula* .... *fuscagula*
77 *Cyclostoma* ... *striata*
78 *Achatina* .... *Vanuxemensis*
79 *Io* .... *spinosa*

80 *Paludina* ... *Burroughiana*
81 *Lymnæa* .... *acuta*
82 ,, ... *exilis*
83 *Physa* ...... *elliptica*
84 *Ampullaria* *Hopetonensis*
85 *Paludina* ... *Georgiana*
86 *Succinea* .... *retusa*

Drawn by J. Drayton.

OBSERVATIONS

ON THE

GENUS UNIO,

&c.

OBSERVATIONS

ON THE

GENUS UNIO,

TOGETHER WITH

DESCRIPTIONS OF NEW GENERA AND SPECIES IN THE FAMILIES NAIADES, COLIMACEA, LYMNÆANA, MELANIANA AND PERISTOMIANA.

READ BEFORE THE AMERICAN PHILOSOPHICAL SOCIETY, AND ORIGINALLY PUBLISHED IN ITS TRANSACTIONS.

WITH NUMEROUS COLOURED PLATES.

BY ISAAC LEA,

MEMBER OF THE AM. PHIL. SOC.; OF THE ACAD. OF NAT. SCIENCES OF PHIL.; OF THE LYCEUM OF NAT. HIST. OF NEW YORK; OF THE AMERICAN GEOL. SOC.; OF THE GEOL. SOC. OF PENN.; OF THE UNITED STATES NAVAL LYCEUM; HON. MEM. OF THE BOSTON SOC. OF NAT. HIST.; OF THE MED. SOC. OF ORANGE COUNTY; OF THE ASIATIC SOCIETY, BENGAL; OF THE PHYSICAL AND NATURAL HISTORY SOCIETY OF GENEVA; MEM. OF THE IMPERIAL SOC. OF NAT. HIST. OF MOSCOW; OF THE ROYAL PHYSICAL SOC. OF EDINBURGH; COR. MEM. OF THE ZOOLOGICAL SOC. OF LONDON; OF THE ROYAL ACAD. OF SCIENCES OF TURIN; OF THE LINNÆAN SOC. OF BORDEAUX; OF THE NAT. HISTORY SOCIETY OF ATHENS; OF THE NAT. HIST. SOC. OF MONTREAL; ETC. ETC.

VOL. II.

PHILADELPHIA:
PRINTED FOR THE AUTHOR.

TO THOMAS G. LEA.

My Dear Brother:

I fulfil a pleasing duty in dedicating to you this volume. The frequent reference to your name in this and the previous one, testifies to the interest you have taken in my labours, and points to the great assistance I have received from you in the progress of my researches. I feel doubly indebted to you for the many facts of which you have put me in possession, and the sympathy you have always felt in the difficulties which lay in my way.

With sentiments of esteem and affection,

I am truly yours,

ISAAC LEA.

Philadelphia, May 1, 1838.

CONTENTS.

Page

Description of Freshwater and Land Shells. Read December 19, 1834. . . . 1

Continuation. Read January 2, 1835. 19

Do. Read September 18, 1835. 21

Do. Read February 5, 1836. 23

Do. Read July 15, 1836. 48

Do. Read August 19, 1836. 69

Do. Read November 4, 1836. 73

Do. Read July 21, 1837. 95

Do. Read January 5, 1838. 103

Do. Read January 19, 1838. 108

Systematic Index of the Family Naïades. 110

Synopsis of the Family Naïades. 113

Division of the Family Naïades. 118

Genus Margarita. 121

Subgenus Unio. 121

Subgenus Margaritana. 134

Subgenus Dipsas. 136

Subgenus Anodonta. 137

Genus Platiris. 141

Subgenus Iridina. 141

Subgenus Spatha. 141

Addenda. 143

Geographical Distribution of the Species of the Family Naïades. 145

Genus Margarita. 145

Subgenus Unio. 145

Subgenus Margaritana. 148

Subgenus Dipsas. 149

Subgenus Anodonta. 149

Genus Platiris. 150

Subgenus Iridina. 150

Subgenus Spatha. 150

List of Authors. 152

ERRATA.

Page 48, line 15 from top, for 1837 read 1836.
Page 49, line 17 from top, for *is* read *in.*
Page 59, line 7 from top, for *left valve* read *right valve.*
Page 59, line 17 from bottom, for *forms* read *performs.*
Page 96, line 8 from top, for *Pepinianus* read *Pepiniana.*
Page 131, line 9 from top, for *Membranacca* read *Membranaceus.*

Description of New Freshwater and Land Shells. By Isaac Lea.
Read December 19, 1834.

ANODONTA GIGANTEA. Plate I. fig. 1.

Testâ ovatâ, inflatâ, antice latissimâ, postice angulatâ, inæquilaterali; valvulis crassis; natibus prominentibus; margaritâ albâ.

Shell ovate, inflated, broad before, angular behind, inequilateral; valves thick; beaks prominent; nacre pearly white.

Hab. near Port Gibson. T. W. Robeson.
My Cabinet.

Diam. 3·3, Length 4·8, Breadth 7·8 inches.

Shell ovate, inflated, broad before, angular behind, inequilateral; substance of the shell thick; beaks prominent, granulate at tip; epidermis dark brown, smooth; anterior and posterior cicatrices both confluent; dorsal cicatrices near the margin anterior to the beaks; cavity of the shell very deep; cavity of the beaks deep; nacre white and richly pearly.

Remarks.—A single valve only of this species could be obtained, and that many years ago. Several attempts to procure more have proved abortive, and I now venture from it to establish the species. This valve has a greater area than any of the *Naïades* which I have yet seen, and its capacity is also greater. It differs in outline, as well as in size, from any species yet described, being broader before and more angular behind.

ANODONTA OVATA. Plate II. fig. 2.

Testâ ovatâ, subcompressâ, transversâ, inæquilaterali; valvulis subtenuibus; natibus prominulis; margaritâ albâ.

Shell ovate, somewhat compressed, transverse, inequilateral; valves rather thin; beaks somewhat prominent; nacre white.

Hab. near Marietta, Ohio. Dr Hildreth.
My Cabinet.
Cabinet of Mr Hyde.

Diam. 1·5, Length 2·2, Breadth 4 inches.

Shell ovate, somewhat compressed, transverse, inequilateral; substance of the shell rather thin; beaks somewhat prominent and granulate at tip; ligament rather short; epidermis greenish brown, wrinkled, apparently without rays; anterior and posterior cicatrices both confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell deep; cavity of the beaks shallow; nacre white, sometimes bluish.

Remarks.—Very recently this shell has been sent to me by Dr Hildreth. I presume it is from the vicinity of Marietta, where he resides. It is certainly distinct from any species with which I am acquainted. It perhaps most resembles the *cataracta* (Say), but differs in being more elliptical. It also differs in the beaks, the *cataracta* being undulated, while this shell is rather granulate at tip.

UNIO BENGALENSIS. Plate II. fig. 3.

Testâ ellipticâ, transversâ, inæquilaterali, inflatâ; valvulis tenuissimis; natibus minuté undulatis; dentibus cardinalibus tenuibus et laminatis; lateralibus sublongis, linearibusque; margaritâ purpureâ.

Shell elliptical, transverse, inequilateral, inflated; valves very thin; beaks minutely undulated; cardinal teeth thin and lamellar; lateral teeth rather long and linear; nacre purple.

Hab. Bengal. Dr Burrough.
Cabinet of Dr Burrough.

Diam. ·8, Length 1·3, Breadth 2·2 inches.

Shell elliptical, transverse, inequilateral, inflated about the umbones; substance of the shell very thin; beaks somewhat inflated, beautifully and minutely undulated, the undulations being parallel and oblique to the plane of the disk, and angular on the umbonial slope; ligament thin and straight; epidermis reddish brown and obscurely rayed; cardinal teeth very small, thin, lamellar, and single in both valves; lateral teeth rather long, linear, slightly divided in the left valve; anterior and posterior cicatrices indistinct, and both confluent; dorsal cicatrices small, and placed in the centre of the cavity of the beaks; palleal impression scarcely perceptible, and remote from the border; cavity of the shell deep; cavity of the beaks rounded; nacre very thin and purple.

Remarks.—Among the numerous rare and beautiful shells brought by Dr Burrough from his last voyage, was the single specimen described above. It was purchased in Calcutta, and Dr B. thinks it inhabits the Ganges. It is a very distinct species, and differs in the teeth from all those with which I am acquainted. Without a close examination it might be taken for an *Anodonta*, the teeth being very small and almost linear. In these it resembles somewhat the *Symphynota discoidea* (nobis) and *S. bi-alata* (nobis), but the curve differs, and the lateral tooth of the left valve is distinctly cleft. In the teeth there is certainly a strong approximation to that group which possesses teeth with a simple curve line. In the beaks it is remarkable for the close, parallel undulations, which extend some distance from their apex, and make, by being reflected, quite an acute angle on the umbonial slope.

UNIO VENUSTUS. Plate II. fig. 4.

Testâ ellipticâ, transversâ, subcompressâ, luteâ, inæquilaterali; valvulis subtenuibus; natibus vix prominentibus; dentibus cardinalibus parvis; lateralibus subcurvis; margaritâ albâ et iridescente.

Shell elliptical, transverse, somewhat compressed, yellowish, inequilateral; valves somewhat thick; beaks scarcely prominent; cardinal teeth small; lateral teeth rather curved; nacre pearly white and iridescent.

Hab. Potosi, Missouri. John Perry, Esq.
Cincinnati, Ohio. T. G. Lea.
My Cabinet.

Diam. ·5,	Length 1,	Breadth 1·7 inches.

Shell elliptical, transverse, somewhat compressed, yellowish, inequilateral; substance of the shell somewhat thick; beaks scarcely prominent, pointed at tip, and furnished with very minute undulations; ligament rather short; epidermis yellow, with green, somewhat sinuous rays; cardinal teeth small, elevated, deeply cleft in the left valve; lateral teeth somewhat long, rather curved and enlarged at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beak small and angular; nacre thin behind, pearly white and iridescent.

Remarks.—The specimen here figured was sent to me some years since by John Perry, Esq., who obtained it near the lead mines of Potosi, in Missouri. Subsequently my brother, T. G. Lea, has found the species near Cincinnati. As it very strongly resembles a young *U. crassus* (Say), it may very properly be placed in the group of which that species may be considered the type.

UNIO VAUGHANIANUS. Plate III. fig. 5.

Testâ obovatâ, transversâ, subinflatâ, posticè subemarginatâ, inæquilaterali; valvulis tenuibus; natibus vix prominentibus; dentibus cardinalibus parvis erectisque; lateralibus rectis; margaritâ salmonis colore tinctâ.

Shell obovate, transverse, somewhat inflated, subemarginate behind, inequilateral; valves thin; beaks scarcely prominent; cardinal teeth small and erect; lateral teeth straight; nacre salmon colour.

Hab. Sawney's Creek, near Camden, S. C. Professor Ravenel.
My Cabinet.
Cabinet of Professor Ravenel.
Cabinet of Dr Blanding.
*Unio Carolinensis.** Professor Ravenel's Letter.

Diam. ·7, Length 1·2, Breadth 2 inches.

Shell obovate, transverse, somewhat inflated, enlarged towards the posterior basal margin, behind which it is subemarginate, slightly depressed before the umbonial slope, inequilateral; substance of the shell thin and iridescent behind, thicker and salmon coloured before; ligament rather thin and short; epidermis almost black, and obscurely rayed posteriorly; cardinal teeth double in both valves, small, compressed and erect; lateral teeth straight; anterior cicatrices distinct; posterior cicatrices confluent and scarcely visible; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell deep; cavity of the beaks shallow and angular; nacre salmon coloured and beautifully iridescent.

Remarks.—Professor Ravenel very kindly sent me specimens of this shell nearly two years ago, and I owe to Dr Blanding the possession subsequently of others. This species distinctly appertains to that group of which the *U. nasutus* (Say) may be considered the type. It is rayed like that shell, but may at once be distinguished by the bluntness of the posterior portion of the shell, as well as by its enlargement towards the basal margin.

---

* This name being preoccupied by Bosc for a shell of this genus, I have considered it necessary to give it another, and propose that of the worthy treasurer of this society, John Vaughan, Esq.

Unio pulcher. Plate III. fig. 6.

Testâ ellipticâ, transversâ, subcompressâ, inæquilaterali; valvulis subcrassis; natibus irregulariter undulatis; epidermide luteâ, radiis tenebroso-viridibus; dentibus cardinalibus erectis; lateralibus prope eorum fines majoribus; margaritâ colore caryophylli tinctâ.

Shell elliptical, transverse, somewhat compressed, inequilateral; valves rather thick; beaks irregularly undulated; epidermis yellow, with dark green rays; cardinal teeth erect; lateral teeth enlarged near their termination; nacre pink coloured.

Hab. near Nashville, Tenn. Professor Troost.
Cabinet of Professor Troost.

Diam. ·8, Length 1·3, Breadth 2·2 inches.

Shell elliptical, transverse, somewhat compressed, inequilateral; substance of the shell rather thick; beaks rather elevated and irregularly undulated; ligament rather long and straight; epidermis yellow; rays dark green, numerous, diverging from the point of the beak over the whole disk; cardinal teeth large, erect, and disposed to be double in both valves, in the left widely cleft; lateral teeth rather long, somewhat curved, enlarged near their termination; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; palleal impression rather indistinct; nacre beautifully pearly and pink coloured.

Remarks.—This species belongs to that group of *Uniones* of which the *crassus* of Say is the type. It differs from the *crassus* in being a smaller species, in the undulations of the beaks and in the rays. The pink colour, which is more intense at the region of the teeth, is strikingly beautiful. The rays of this specimen are very dark, and more defined than in any species I have remarked. I am indebted to the great kindness of Professor Troost for the loan of this shell, to describe and figure.

UNIO OBSCURUS. Plate III. fig. 7.

Testâ ellipticâ, transversâ, inæquilaterali, subinflatâ; valvulis subcrassis; natibus irregulariter undulatis; dentibus cardinalibus elevatis; lateralibus prope eorum fines majoribus; margaritâ albâ et purpureâ.

Shell elliptical, transverse, inequilateral, somewhat inflated; valves rather thick; beaks irregularly undulated; cardinal teeth elevated; lateral teeth larger near their termination; nacre purple and white.

Hab. near Nashville, Tenn. Professor Troost.
Cabinet of Professor Troost.
Cabinet of Mr Hyde. (White nacre.)
Diam. ·8, Length 1·1, Breadth 2 inches.

Shell elliptical, transverse, inequilateral, somewhat inflated; substance of the shell rather thick; beaks slightly elevated and irregularly undulated; ligament rather short; epidermis yellowish brown; rays placed on the posterior part, and somewhat linear; cardinal teeth double in both valves, erect, crenulate, widely cleft in the left; lateral teeth rather long, straight, and enlarged near their termination; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed on the inferior part of the lateral teeth; palleal impression distinct; nacre white anteriorly, purple posteriorly.

Remarks.—I owe to Professor Troost the opportunity of describing this shell. There are no very striking characters in it, but it cannot be classed with propriety with any species which I know. It seems to possess a resemblance to *U. Nashvillianus* (nobis), and to *U. glans* (nobis), two very different species. It is however distinct, and should not be confounded with either. The single specimen here noticed is the only one, I believe, yet found. When more are observed, characters somewhat different may be noticed.

UNIO FISHERIANUS. Plate IV. fig. 8.

Testâ scaleniâ, obliquo-transversâ, compressâ, valde inœquilaterali; valvulis tenuibus; natibus compressis; dentibus cardinalibus lamelliformibus; lateralibus longis subcurvisque; margaritâ purpureâ.

Shell scaleniform, obliquely transverse, compressed, very inequilateral; valves thin; beaks compressed; cardinal teeth lamellar; lateral teeth long and somewhat curved; nacre purple.

Hab. Head of Chester River, Md. Mr Thomas Fisher.
My Cabinet.

Diam. ·6, Length 1·1, Breadth 2·7 inches.

Shell rounded before and acutely angular behind, obliquely transverse, compressed, very inequilateral; substance of the shell thin; beaks flattened and placed near the anterior margin; umbones flattened; umbonial slope elevated; ligament thin and short; epidermis dark brown, smooth; cardinal teeth lamelliform, rather conical, widely cleft in the left valve; lateral teeth long and somewhat curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; palleal impression imperceptible; cavity of the shell very shallow; cavity of the beaks very small; nacre purple.

Remarks.—This belongs to that group of Uniones of which the *nasutus* (Say) is the type. It differs from that species in being more compressed, in being more angular posteriorly and in being apparently without rays. In outline it approaches the *Grayanus* and *Shepardianus* (nobis), but cannot be confounded with either of them.

I owe this species to Mr Thomas Fisher, who brought it from Chester River five or six years ago.

UNIO JEJUNUS. Plate IV. fig. 9.

Testâ suboblongâ, valde transversâ, compressâ, inæquilaterali; valvulis subtenuibus; natibus compressis; dentibus cardinalibus parvis; lateralibus longis rectisque; margaritâ vel purpureâ vel albâ.

Shell somewhat oblong, very transverse, compressed, inequilateral; valves rather thin; beaks compressed; cardinal teeth small; lateral teeth long and straight; nacre purple or white.

Hab. Roanoke.
Also, near Camden, S. C. Dr Blanding.
My Cabinet.
Cabinet of Dr Blanding.

Diam. ·5, Length 1·2, Breadth 2·5 inches.

Shell somewhat oblong, very transverse, compressed, inequilateral; flattened on the sides; subbiangular behind; substance of the shell rather thin; beaks compressed, scarcely prominent; ligament thin and long; epidermis very dark brown and much wrinkled; cardinal teeth small, double in the left and single in the right valve; lateral teeth long, straight, and enlarged at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell very shallow; cavity of the beaks very small; nacre purple or white.

Remarks.—In crossing the Roanoke on the mail-route between Winton and Tarborough in 1827, I found a few imperfect specimens of this shell. Last year Dr Blanding had the kindness to give me a more perfect specimen from near Camden, S. C., which confirmed me in my previous impression of its being distinct from any described species. In its general outline and appearance it strongly resembles the *U. complanatus* (Soland.), but is more compressed, and is disposed to be biangular behind.

UNIO ARCTIOR. Plate IV. fig. 10.

Testâ angulato-ellipticâ, valde transversâ, compressâ; valvulis subtenuibus; natibus compressis et undulatis; dentibus cardinalibus parvis; lateralibus longis; margaritâ albâ et salmonis colore tinctâ.

Shell narrow-elliptical, very transverse, compressed; valves rather thin; beaks compressed and undulated; cardinal teeth small; lateral teeth long; nacre white and salmon colour.

Hab. Ohio River, near Cincinnati. T. G. Lea.
My Cabinet.
Cabinet of P. H. Nicklin.
Cabinet of Professor Vanuxem.
Cabinet of William Hyde.

Diam. ·7, Length 1·1, Breadth 2·3 inches.

Shell narrow, elliptical, very transverse, subangular behind, flattened on the sides; substance of the shell rather thin; beaks compressed, undulated; ligament rather long and slender; epidermis dark brown, wrinkled; cardinal teeth very small; lateral teeth long, straight, and enlarged at posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the plate between the cardinal and lateral teeth; cavity of the shell very shallow; cavity of the beak shallow and subangular; nacre white, salmon colour, and sometimes purple.

Remarks.—I have for some years been in doubt if this should be separated from the *gibbosus* of Barnes, of which it has generally been considered a variety. After proper examination, believing it to be distinct, I propose to separate it from that species. It certainly very closely resembles the *gibbosus*, but may at once be distinguished by its being a smaller shell, and possessing much less substance. The *gibbosus* is generally purple; this species is usually white or salmon colour, but sometimes purple.

UNIO TURGIDUS. Plate V. fig. 11.

Testâ subrotundâ, inflatâ, tuberculatâ, subæquilaterali; valvulis crassis; natibus elevatis; dentibus cardinalibus grandibus compressisque; lateralibus brevibus subrectisque; margaritâ albâ et iridescente.

Shell subrotund, inflated, tuberculated, nearly equilateral; valves thick; beaks elevated; cardinal teeth large and compressed; lateral teeth short and nearly straight; nacre white and iridescent.

Hab. near New Orleans. Mr Barabino.
My Cabinet.

Diam. 1, Length 1·3, Breadth 1·6 inches.

Shell nearly round, inflated, tuberculated, nearly equilateral, subangular behind; substance of the shell thick; beaks thick and elevated; umbonial slope scarcely elevated; ligament short and thick; epidermis dark brown; tubercles small, crowded on the umbones, and sparse towards the margin; cardinal teeth very large, compressed, the anterior section being much elevated and much enlarged; lateral teeth short and nearly straight; anterior cicatrices deeply impressed and distinct; posterior cicatrices distinct, the smaller being scarcely visible; dorsal cicatrices placed on the inferior part of the cardinal tooth; palleal impression deep; cavity of the shell rounded; cavity of the beaks deep and angular; nacre pearly white and iridescent.

Remarks.—For several specimens of this species I am indebted to the kindness of the late Mr Barabino. It has more resemblance to the *U. pustulosus* (nobis) than any shell with which I am acquainted, but differs in being more inflated, in the number, size and position of the tubercles. In the *pustulosus* these are large and more frequent towards the basal margin, the beaks being nearly devoid of them, while in the *turgidus* they are numerous on the umbones and towards the beaks. In the cardinal teeth there is a still greater disparity. In the former species these are spread out, while in the latter they are compressed, and present a very remarkable character in the great elevation of the anterior section. The large ray, so generally found on the *pustulosus*, is not found on the specimens which I have seen of *turgidus*. This or more may perhaps be found on perfect or young individuals.

UNIO COCCINEUS. Plate V. fig. 12.

Testâ subtriangulari, obliquâ et subcompressâ; valvulis antice crassioribus; natibus subelevatis retusisque; dentibus cardinalibus crassis; lateralibus crassis et subcurvis; margaritâ coccineâ.

Shell subtriangular, oblique and somewhat compressed; valves thicker anteriorly; beaks rather elevated and retuse; cardinal teeth thick; lateral teeth thick and somewhat curved; nacre bright red.

Hab. Ohio River, near Marietta. Dr Hildreth.
Mahoning river, Ohio. Dr Kirtland.
Near Columbus, Ohio. Mr Lapham.
My Cabinet.
Cabinet of P. H. Nicklin.
Cabinet of W. Hyde.
Cabinet of Professor Vanuxem.
Unio coccineus. Dr Hildreth's letter.

Diam. 1·7, Length 2, Breadth 2·2 inches.

Shell subtriangular, oblique, somewhat compressed; substance of the shell thick anteriorly and thinner posteriorly; beaks rather elevated, retuse, and possessed of one or two undulations at the apex; ligament rather long and curved; epidermis dark reddish brown, with regular distinct marks of growth; cardinal teeth large, crenate, and deeply cleft in the left valve, and emerging from a pit in the right; lateral teeth rather long, thick, and somewhat curved; anterior cicatrices distinct, the great one forming a deep pit; posterior cicatrices distinct, the smaller one being placed at the end of the lateral tooth; dorsal cicatrices situated on the inferior part of the cardinal tooth; cavity of the shell shallow; cavity of the beaks rather deep and angular; nacre bright red, sometimes salmon, rarely white.

Remarks.—About eighteen months since, Dr Hildreth sent me a single specimen of this species, which he communicated under the name of *coccineus.* I have since received from Dr Kirtland some fine suites from Poland, Ohio, where they seem to be common. In the interior it resembles *U. pyramidatus* (nobis). It is, however, easily distinguished by its being more compressed, less inflated on the umbones, and in the beaks being less elevated.

UNIO SOLIDUS. Plate V. fig. 13.

Testâ obliquâ, inflatâque; valvulis crassissimis; natibus elevatis retusisque; epidermide rufo-viridi; dentibus cardinalibus crassis; lateralibus obliquis, brevibusque; margaritâ albâ.

Shell oblique, inflated; valves very thick; beaks elevated and retuse; epidermis rusty-green; cardinal teeth thick; lateral teeth oblique and short; nacre white.

Hab. Ohio River, at Cincinnati. T. G. Lea.
Mahoning River, Ohio. Dr Kirtland.
My Cabinet.

Diam. 1·1, Length 1·7, Breadth 1·8 inches.

Shell oblique, inflated, much enlarged at the umbones; substance of the shell very thick; beaks very much elevated, retuse, and possessed of one or two undulations at the apex; ligament rather short and thick; epidermis rusty-green, and sometimes obscurely rayed; cardinal teeth thick, crenate, and deeply cleft in the left, and emerging from a pit in the right valve; lateral teeth thick, slightly curved and nearly parallel with the line of the cardinal teeth; anterior cicatrices distinct, the great one forming a deep pit; posterior cicatrices distinct, the smaller one being placed at the end of the lateral teeth; dorsal cicatrices situated on the interior of the plate between the cardinal and lateral teeth; cavity of the shell shallow; cavity of the beaks rather deep and angular; nacre pearly white.

Remarks.—This species has a strong resemblance to the *U. undatus* (Barnes), and I have only now, after having had several specimens for some years in my possession, satisfied myself, by examining complete suites, of its being specifically different. It may be distinguished by its being more rounded at the basal margin, by its more elevated beaks, by its colour being more green, and, when the rays exist, in their being more capillary. In the elevation and retuseness of the beaks it resembles the *U. pyramidatus* (nobis), but differs in the depression before the umbonial slope in that shell, and in being white in the nacre, while that species is red. The undulations of the beaks can only be observed when the shell is perfect there, and I have observed it so but in very young individuals.

Unio Hydianus. Plate VI. fig. 14.

Testâ ellipticâ, transversâ, radiatâ, valde inæquilaterali, subinflatâ; valvulis subcrassis; dentibus cardinalibus elevatis; lateralibus longis, à cardinalibus separatis; margaritâ albâ et iridescente.

Shell elliptical, transverse, rayed, very inequilateral, somewhat inflated; valves rather thick; cardinal teeth elevated; lateral teeth long and separated from the cardinal teeth; nacre pearly white and iridescent.

Hab. Teche River, Louisiana. W. M. Stewart.
Vicinity of New Orleans. Mr Barabino.
My Cabinet.
Cabinet of Mr Stewart.
Cabinet of Mr Hyde.

Diam. 1·1, Length 1·4, Breadth 2·5 inches.

Shell elliptical, transverse, usually beautifully rayed, very inequilateral, somewhat inflated; substance of the shell rather thick; beaks placed near the anterior margin; ligament rather long; epidermis yellow; rays dark green and extending over the disk; cardinal teeth double in both valves, erect, conical; lateral teeth rather long, slightly curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; palleal impression indistinct; cavity of the shell deep; cavity of the beaks subangular; nacre beautifully pearly white and iridescent.

Remarks. The beautiful specimen figured here I owe to the kindness of Mr W. M. Stewart, who brought it from Louisiana about three years ago. It belongs to the group which contains *Unio radiata*

(Gmel.) and *luteola* (Lam.), (*siliquoideus*, Barnes). It perhaps most resembles the latter, but differs in being a smaller shell, in being more pearly, and in having the beaks nearer to the anterior margin. It is generally found rayed, but in some individuals the rays are wanting; none of my specimens have perfect beaks. I have great pleasure in naming it after one of our most experienced conchologists and most assiduous students of this branch of zoology, Mr William Hyde.

UNIO INTERRUPTUS. Plate VI. fig. 15.

Testâ ellipticâ, compressâ, transversâ, inæquilaterali; valvulis subcrassis; radiis interruptis; natibus compressis; dentibus cardinalibus parvis; lateralibus longis subcurvisque; margaritâ albâ.

Shell elliptical, compressed, transverse; inequilateral; valves somewhat thick; rays interrupted; beaks compressed; cardinal teeth small; lateral teeth rather long and curved; nacre white.

Hab. Harpeth River, Ten. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.

Diam. ·9, Length 1·5, Breadth 2·6 inches.

Shell elliptical, compressed, transverse, inequilateral, subemarginate on the posterior dorsal margin; substance of the shell somewhat thick; beaks rather prominent, somewhat compressed, undulated about the tip; umbones flattened; ligament rather short; epidermis yellow, rather smooth; rays green, broad, interrupted, radiating to all parts of the margin; cardinal teeth small, conical, deeply cleft in the left valve; lateral teeth long, and somewhat curved, enlarged at posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks small and subangular; nacre pearly white.

Remarks.—Two specimens of this beautiful species were sent to me about three years ago, by Professor Troost, of Nashville. Expecting to receive other specimens from him, I deferred making a description, least they should prove only a variety of *U. crassus* (Say), the young and perfect of which they strongly resemble in many of their characters. The *interruptus* differs in the rays, in the flatness of its sides, and particularly in the undulations of the beaks. The broad interrupted rays of this species are striking, and between them may be usually observed those which are quite capillary. It may be distinguished at once from the *pulcher* (herein described) by its rays, the latter being smaller and not interrupted.

AMPULLARIA PEALIANA. Plate XXIII. fig. 77.

Testâ subglobosâ, lævi, solidâ, imperforatâ, luteâ, faciatâ; spirâ acutâ; anfractibus quinis; aperturâ subovatâ, fasciatâ.

Shell subglobose, smooth, solid, imperforate, yellow, banded; spire acute; whorls five; aperture subovate, banded.

Operculum horny.

Hab. Turbaco, Colombia, South America. T. R. Peale.
My Cabinet.
Philadelphia Museum.
Diam. 1·1, Length 1·3 inches.

Remarks.—Among the fine collection of rare and beautiful objects in natural history, obtained by Mr Peale during his late journey into Colombia, was this fine *Ampullaria.* The yellow ground of the shell is distinctly marked with rich brown bands, which are visible within. In being imperforate, it resembles the *A. crassa* (Swainson), but differs in being larger, in being more globose, and in having a more effuse outer lip. I dedicate with peculiar pleasure this shell to the discoverer, one of the most enthusiastic and successful cultivators of natural history in our country. Mr Peale found this species in the dry bed of a brook which is devoid of water during half the year.

PALUDINA HYALINA. Plate XXIII. fig. 81.

Testâ obtuso-conicâ, carinatâ, pellucidâ, infrà complanatâ; anfractibus quaternis; suturis valde impressis; aperturâ latè rotundatâ.

Shell obtusely conical, carinate, diaphanous, flattened below; whorls four; sutures very much impressed; aperture widely rounded.

Hab. near Poland, Ohio. Dr Kirtland.

Cabinet of Mr Hyde.

Diam. ·2, Length ·2 of an inch nearly.

Remarks.—Dr Kirtland sent the only specimen of this shell I have seen to Mr Hyde, under the impression that it was a deformed specimen of *Planorbis*. Mr Hyde communicated it to me as a new species, of which there cannot, I think, be a doubt. It is very remarkable for the flatness of the inferior portion of the last whorl, and for the carina on the periphery which this causes. It is perhaps thinner and more transparent than any species yet described.

MELANIA INFLATA. Plate XXIII. fig. 98.

Testâ conicâ, inflatâ, tenebroso-corneâ; apice obtuso; anfractibus quinis, subconvexis; columella notatâ; labro valdè expanso.

Shell conical, inflated, dark horn-colour; apex obtuse; whorls five, rather convex; columella marked; outer lip spread out.

Hab. Indian Creek, Vir., West of Alleghany Mountains. P. H. Nicklin.

My Cabinet.
Cabinet of P. H. Nicklin.

Diam. ·4, Length ·6 inches.

Remarks.—I am indebted to Mr Nicklin for this new species, having been found by him in Indian Creek, between the Salt and Red Sulphur Springs. The sinus is so small, that at first view it may easily escape observation. The aperture is large, and in this it has some resemblance to a *Paludina*. Near the base of the columella a purple spot may be usually observed. It resembles most in outline the *M. tuberculata* (nobis), but differs in not being angulated, and being entirely without tubercles. In colour it differs entirely. Some individuals have three coloured purple bands in the interior, while others are devoid of them.

PHYSA AUREA. Plate XXIII. fig. 106.

Testâ sinistrosâ, subinflatâ, aureâ, pellucidâ; spirâ breviusculâ; anfractibus quaternis; labro marginato; aperturâ subinflatâ.

Shell sinister, rather inflated, golden colour, pellucid, shining; spire rather short; whorls four; outer lip margined; aperture somewhat inflated.

Hab. Hot Spring, Bath county, Virginia. P. H. Nicklin.
My Cabinet.
Cabinet of P. H. Nicklin.

Diam. ·3, Length ·5 inches.

Remarks.—Mr Nicklin informed me that he found the *Physa aurea* in a little water-course, by which a hot and a cold spring discharge their mingled waters. The former exhibits a temperature of 106 degrees, and the latter of about 56 degrees of the scale of Fahrenheit.

Near the meeting of the waters, one side of the little stream is cold and the other side hot; and multitudes of these beautiful *Physæ* are to be found on both sides of the line of junction, availing themselves of the power which the locality affords them, of changing their climate according to their fancy.

Continuation of Mr Lea's Paper. Read, January 2d, 1835.

UNIO LAMELLATUS. Plate VI. fig. 16.

Testâ subovatâ, transversâ, subinflatâ, nitidâ; valvulis tennuissimis; natibus vix prominulis, undulatis; dentibus cardinalibus longis, tenuibus et laminatis; lateralibus longis, tenuibus subrectisque; margaritâ cœruleâ.

Shell subovate, transverse, somewhat inflated, shining; valves very thin; beaks scarcely prominent, undulated; cardinal teeth long, thin and lamellar; lateral teeth long, thin and nearly straight; nacre bluish.

Hab. Bengal. Captain Lang.

My Cabinet.

Diam. 1, Length 1·5, Breadth 2·6 inches.

Shell subovate, transverse, somewhat inflated, carinate behind; dorsal line nearly straight; substance of the shell very thin; beaks somewhat prominent, with minute undulations following the umbonial slope; umbonial slope furnished with two capillary raised lines, running nearly parallel; ligament rather short; epidermis dark brown and finely polished; rays none; cardinal teeth long, thin, lamellar, single in the *left* valve and double in the *right;* lateral teeth long, thin, and nearly straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated nearly in the cavity of the beaks; cavity of the shell somewhat deep; cavity of the beak shallow; nacre bluish.

Remarks.—Several specimens of this shell, with the animal, were brought by Captain Lang in his late voyage to Calcutta. In the conformation of the animal I could perceive no difference from that of our common species. It may be considered to be most nearly allied to *U. Corrianus* (nobis). It differs from that shell in its most remarkable character, its cardinal teeth, which are longer and more lamelliform than in any species I am acquainted with. The teeth of this species are the more interesting, as they present a link approaching those *Naïades* which have a single line under the dorsal margin, and which are connected with this species through the *Symphynota Bengalensis* (nobis). Intervening species may be discovered to make the "nuance" complete.

MELANIA PLICATA. Plate XXIII. fig. 95.

Testâ subturritâ, plicatâ, castaneâ, tuberculatâ, fasciatâ; suturis impressis; aperturâ ovatâ.

Shell somewhat turrited, folded, chesnut coloured, tuberculated, banded; sutures impressed; aperture ovate.

Hab. Bengal?

My Cabinet.

Diam. ·8, Length 2 inches.

Remarks.—Among numerous freshwater shells brought by Captain Lang from Calcutta, I obtained a single specimen of this species. About one-third the distance below the suture it is furnished with a row of tubercles, each of which terminates a somewhat oblique fold. Inferior to this there is a disposition to carination. The tubercles give the shell slightly the aspect of *M. amarula* (Lam.), but it cannot be mistaken for that species, as its spire is quite elevated. The individual above described being decollated, it is impossible to give the number of whorls, or the character of the apex.

Continuation of Mr Lea's Paper. Read, September 18th, 1835.

GENUS MEGASPIRA.

Testâ clavatâ; aperturâ subovatâ, infernè rotundatâ; marginibus reflexis, supernè disjunctis; columellâ pluriplicatâ, basi integrâ, non effusâ.

Shell clavate; aperture nearly oval, below rounded; margins reflected, above disjoined; columella many-folded, below entire, not effuse.

Remarks.—The genus *Megaspira** is proposed for a single species. It is a most curious and interesting shell, and although it is closely analogous to the genera *Bulimus*, *Pupa* and *Auricula* in some of its characters, cannot be with propriety placed in either of them. Unfortunately we know nothing of the animal; but if we may judge from the peculiar form of the shell, it will doubtless be found to differ much from these genera.

MEGASPIRA RUSCHENBERGIANA. Plate XXIII. fig. 101.

Testâ cylindraceo-turritâ, valdè striatâ, subfuscâ, maculis longitudinalibus rufo-fuscis ornatâ, apice consolidatâ; anfractibus tribus et viginti, subplanulatis; spirâ ad apicem obtusiusculâ; columellâ quadruplicatâ; labro reflexo.

Shell subcylindrical, turrited, thickly striate, brownish, furnished with longitudinal reddish-brown spots, having a solid apex; whorls twenty-three, rather flattened; spire obtuse at the apex; columella with four folds; outer lip reflected.

Hab. Brazil? W. S. W. Ruschenberger, M.D.
My Cabinet.
Diam. ·5, Length 2·5 inches.

---

* μεγας, magnus, and σπεὶρα, spira.

Remarks.—I owe to the kindness of Dr Ruschenberger, of the United States navy, the interesting and curious specimen above described. It was purchased by him in Rio de Janeiro, its exact habitat being unknown to him, having been kept perfectly secret by the person from whom he obtained it. The remarkable elevation of this shell eminently distinguishes it from any species with which I am acquainted. The lower portion of the mouth is slightly thrown back, and where the lip joins the bottom of the columella, it is reflected on the whorl, forming a false umbilicus. From this point three connected folds pass into the interior of the cavity of the shell, and half way up the columella a larger and better defined fold is placed, which in the front aspect has the appearance of a tooth. The whorls are slightly curved, and the aperture is about one-sixth the length of the shell.

PALUDINA PALLIDA. Plate XXIII. fig. 104.

Testâ ventricosâ, tenui, pallidâ, lævi; suturis impressis; anfractibus quaternis, convexis; aperturâ subrotundâ.

Shell ventricose, thin, light horn-colour, smooth; sutures impressed; whorls four, convex; aperture nearly round.

Hab. near Cincinnati, Ohio. T. G. Lea.
My Cabinet.
Diam. ·3, Length ·4 of an inch.

Remarks. This shell has been recently found by my brother, and I believe has not before been observed. It might at first be mistaken for a young shell, on account of its pale yellow colour and translucency. In form, however, it differs from any species I have examined, the last whorl being very much enlarged, and the aperture being very large.

Continuation of Mr Lea's Paper. Read, February 5th, 1836.

UNIO PUMILUS. Plate VII. fig. 17.

Testâ subtriangulari, inæquilaterali, posticè subbiangulatâ; valvulis subtenuibus; natibus prominulis; epidermide tenebroso-fuscâ; dentibus cardinalibus grandibus; lateralibus brevibus rectisque; margaritâ albâ.

Shell subtriangular, inequilateral, behind subbiangular; valves rather thin; beaks somewhat prominent; epidermis dark brown; cardinal teeth large; lateral teeth short and straight; nacre white.

Hab. Black River, North Carolina.
My Cabinet.
Diam. ·5, Length ·8, Breadth 1·1 inches.

Shell subtriangular, inequilateral, behind subbiangular, somewhat carinate; substance of the shell rather thin; beaks somewhat prominent; ligament short; epidermis dark brown, and apparently without rays; cardinal teeth large, and deeply cleft in the left valve; lateral teeth short and straight; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices situated on the under part of the cardinal teeth; cavity of the shell rather deep; cavity of the beaks angular; nacre bluish white.

Remarks.—A single individual of this species was found by me in 1827, in crossing the Black River, on the road to Fayetteville from Smithfield. The publication of it has been delayed, in the hope of other specimens being found. Although it has every appearance of an adult shell, it may be found larger. Nevertheless, I have no doubt but that it is among the smallest of the genus. It approaches in most of its characters the *modestus* (Fer.), from Brazil, but it is not so thick a shell, and is rather smaller.

UNIO TAMPICOENSIS. Plate VII. fig. 18.

Testâ ovatâ, inflatâ, transversâ, subcarinatâ, inæquilaterali; valvulis crassis; natibus subprominulis; epidermide nigricante; dentibus cardinalibus magnis; lateralibus longis, subrectis magnisque; margaritâ albâ et iridescente, rarò roseâ.

Shell ovate, inflated, transverse, subcarinate, inequilateral; valves thick; beaks somewhat prominent; epidermis blackish; cardinal teeth large; lateral teeth long, rather straight and large; nacre white and iridescent, rarely rose coloured.

Hab. River Tampico, Mexico.
River Medellin, Mexico. Dr Burrough.
My Cabinet.
Cabinet of Dr Burrough.
Cabinet of Academy of Natural Sciences.

Diam. 1·7, Length 2·8, Breadth 4·3 inches.

Shell ovate, inflated, transverse, subcarinate, inequilateral; substance of the shell thick, thinner behind; beaks somewhat prominent; ligament large and long; epidermis nearly black, and apparently without rays; cardinal teeth large, and deeply cleft in the left valve; lateral teeth long, rather straight, and large; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed across the cavity of the beak, and on the inferior part of the cardinal teeth; cavity of the shell large; cavity of the beaks somewhat deep and angular; nacre white and iridescent, rarely rose colour.

Remarks.—The specimen figured here, I owe to the kindness of Richard Ronaldson, Esq., who procured it from the commander of a vessel trading to Tampico. It was brought from some distance above that city. Dr Burrough subsequently procured the same species from the river Medellin, ten miles south of Vera Cruz. It is a fine shell, and has not much resemblance to any one of ours. It perhaps, in outline and in form of the teeth, most resembles *U. crassus* (Say). In the older specimen, the epidermis is almost black—in the younger, it is of a yellow brown, and in this stage indistinct rays may occasionally be observed. The general colour of the nacre seems to be white, with a disposition to pinkish in the teeth. Sometimes this colour extends over the whole of the thick parts of the nacre, which is very pearly; a tint of salmon colour, in some individuals, may be observed in the cavity of the shell and beaks. The dorsal line in the specimen before me, is slightly tuberculated in an irregular manner.

UNIO CUMBERLANDICUS. Plate VII. fig. 19.

Testâ ellipticâ, transversâ, inæquilaterali; valvulis tenuibus; natibus prominulis; epidermide luteâ, radiatâ; dentibus cardinalibus parvis; lateralibus longis rectisque; margaritâ albâ et iridescente.

Shell elliptical, transverse, inequilateral; valves thin; beaks somewhat prominent; epidermis yellow, radiated; cardinal teeth small; lateral teeth long and straight; nacre white and iridescent.

Hab. Cumberland River, Ten. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.

Diam. ·5, Length ·8, Breadth 1·5 inches.

Shell elliptical, transverse, inequilateral, umbonial slope rounded; substance of the shell thin, thicker before; beaks somewhat prominent; ligament short; epidermis yellow, with numerous nearly equidistant rays; cardinal teeth small, double in the left valve, and disposed to be bifid in the right; lateral teeth long and straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks small; nacre white, and very iridescent behind.

Remarks.—I owe this shell to the kindness of Professor Troost. It most resembles *U. iris* (nobis), and may easily be mistaken for that species. It differs in being less transverse, in being more yellow and in having fewer rays.

Unio simus. Plate VIII. fig. 20.

Testâ ovatâ, transversâ, compressâ, inæquilaterali, postice subangulatâ; valvulis subcrassis; natibus prominulis; epidermide luteolâ, radiatâ; dentibus cardinalibus parvis; lateralibus longis crassisque; margaritâ albâ et iridescente.

Shell ovate, transverse, compressed, inequilateral, subangular behind; valves somewhat thick; beaks somewhat prominent; epidermis somewhat yellow, radiated; cardinal teeth small; lateral teeth long and thick; nacre white and iridescent.

Hab. Cumberland River, Ten. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.

Diam. ·6, Length 1, Breadth 1.7 inches.

Shell ovate, transverse, inequilateral, compressed, subangular behind; substance of the shell somewhat thick, thinner behind; beaks somewhat prominent; ligament rather short; epidermis somewhat yellow, indistinctly rayed; cardinal teeth small, double in the left and single in the right valve; lateral teeth long, thickened towards the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell shallow; cavity of the beaks angular; nacre white and iridescent behind.

Remarks.—This shell was procured by Professor Troost from the Cumberland River, but whether near Nashville or not, I am not informed. It resembles the *Cumberlandicus* (nobis), but is a thicker and heavier shell.

Unio Roanokensis. Plate VIII. fig. 21.

Testâ suboblongâ, transversâ, inæquilaterali, posticè biangulatâ, compressâ; valvulis crassis; natibus prominulis; epidermide terebroso-fuscâ; dentibus cardinalibus parvis; lateralibus longissimis subcurvisque; margaritâ albâ.

Shell somewhat oblong, transverse, inequilateral, biangular behind, compressed; valves thick; beaks somewhat prominent; epidermis dark brown; cardinal teeth small; lateral teeth long and rather curved; nacre white.

Hab. Roanoke River, North Carolina.
Altamaha, Geo. Professor Nuttall and Major Leconte.
My Cabinet.
Cabinet of Major Leconte.

Diam. 1·2, Length 2·2, Breadth 4·7 inches.

Shell somewhat oblong, transverse, inequilateral, biangular behind, compressed, flattened on the umbonial slope; substance of the shell thick; beaks somewhat prominent; ligament very large and long; epidermis dark brown, apparently without rays; cardinal teeth small and striate; lateral teeth long, large, and somewhat curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices on the superior part of the cavity of the beaks; cavity of the shell small; cavity of the beak very small; nacre white.

Remarks.—In crossing the Roanoke some years ago, between Norfolk and Tarborough, I picked up a few specimens of this shell. Since that, Professor Nuttall gave me a single valve from the *Altamaha*, and more recently some large specimens have been brought from the same river by Major Leconte. I found at Tarborough several specimens, which I presume to be the young of this species. This shell strongly resembles a gigantic *complanatus*, and may be considered to belong to that group. The nacre of all the specimens, however, which I have seen is white, and filled with deposite of epidermal matter in a clouded manner. It may perhaps be found sometimes purple.

UNIO NOTATUS. Plate VIII. fig. 22.

Testâ ellipticâ, compressâ, transversâ, inæquilaterali, postice subbiangulatâ; valvulis tenuibus; natibus subprominulis; epidermide rufo-fuscâ, vittatâ; dentibus cardinalibus parvis; lateralibus longis subcurvisque; margaritâ salmonis colore tinctâ et iridescente.

Shell elliptical, compressed, transverse, inequilateral, behind subbiangular; valves thin; beaks rather prominent; epidermis reddish brown, spotted; cardinal teeth small; lateral teeth long and slightly curved; nacre salmon colour and iridescent.

Hab. Cumberland River. Professor Troost.
Cabinet of Professor Troost.
Diam. ·6, Length 1, Breadth 1·8 inches.

Shell elliptical, compressed, transverse, inequilateral, subbiangular behind; substance of the shell thin; beaks somewhat prominent; ligament rather short; epidermis reddish brown, with spotted rays over the whole disk; cardinal teeth small, pointed, and deeply cleft in the left valve; lateral teeth long and slightly curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks angular; nacre salmon colour and very iridescent.

Remarks.—Another of the fine shells sent by Professor Troost from Tennessee. In outline it resembles *U. Vanuxemensis* herein described, but is not so thick a shell, and differs in having rays (interrupted), while the other has none. It is also much smaller in the teeth. The individual before me not being perfect in the beaks, I cannot say if the undulations be the same.

UNIO JAYENSIS. Plate IX. fig. 23.

Testâ angusto-ellipticâ, transversâ, valdè inæquilaterali, posticè subangulatâ; valvulis tenuibus; natibus prominulis; epidermide fuscâ; dentibus cardinalibus compressis; lateralibus longis rectisque; margaritâ purpureâ.

Shell narrow-elliptical, transverse, very inequilateral, subangular behind; valves thin; beaks somewhat prominent; epidermis brown; cardinal teeth compressed; lateral teeth long and straight; nacre purple.

Hab. Florida. J. C. Jay, M.D.
My Cabinet.

Diam. ·8, Length 1·2, Breadth 2·5 inches.

Shell narrow-elliptical, transverse, very inequilateral, subangular behind; subcarinate; substance of the shell thin; beaks somewhat prominent; ligament rather long; epidermis brown, and apparently without rays; cardinal teeth compressed, in the left valve deeply cleft and elevated; lateral teeth long and straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the shell small; cavity of the beaks small; nacre purple and iridescent.

Remarks.—Among other shells for which I am indebted to Dr Jay, were single opposed valves of two individuals of nearly the same size, and for which I propose the name of *Jayensis.* I do not know from what part of Florida they came. This species strongly resembles the *nasutus* (Say), but is not quite so transverse a shell, approaching the *complanatus.* The nacre of both the individuals is of a light purple, bordering on a pinkish tint. In young specimens, it may perhaps be found to possess rays.

UNIO HOPETONENSIS. Plate IX. fig. 24.

Testâ suboblongâ, transversâ, inæquilaterali, compressâ, posticè biangulatâ, ad latus planulatâ; valvulis subcrassis; natibus prominulis, ad apices undulatis; epidermide tenebroso-fuscâ; dentibus cardinalibus parvis; lateralibus longis curvisque; margaritâ purpureâ et iridescente.

Shell somewhat oblong, transverse, inequilateral, compressed, biangular behind, flattened at the sides; valves somewhat thick; beaks scarcely prominent, undulated at the tip; epidermis dark brown; cardinal teeth small; lateral teeth long and curved; nacre purple and iridescent.

Hab. Hopeton, near Darien. Professor Shepard.

My Cabinet.
Cabinet of Professor Shepard.

Diam. ·9, Length 1·7, Breadth 3·4 inches.

Shell somewhat oblong, transverse, inequilateral, compressed, biangular behind, flattened at the umbones and sides, carinate; substance of the shell rather thick; beaks scarcely prominent, undulated at the tip; ligament thin, long and straight; epidermis dark brown and obscurely rayed; cardinal teeth small; lateral teeth very long, curved and enlarged at the posterior end; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the shell rather small; cavity of the beaks small; nacre purple and iridescent.

Remarks.—This shell was procured by Professor Shepard from his friend J. H. Cowper, Esq., with several other fine species. They were found in the canals of the rice fields, where they seem to exist in great perfection.

The *Hopetonensis* very closely resembles some of the varieties of *complanatus.* It differs from it in the teeth, in the carina, and in the possession of a dark border round the inferior part of the margin. In the nacre it appears to be the same, and probably, like the *complanatus*, varies into white and salmon colour.

Unio lugubris. Plate IX. fig. 25.

Testâ ellipticâ, transversâ, subinflatâ, inæquilaterali, posticè biangulatâ; valvulis subcrassis; natibus prominulis; epidermide nigricante; dentibus cardinalibus compressis; lateralibus sublongis subcurvisque; margaritâ purpureâ.

Shell elliptical, transverse, somewhat inflated, inequilateral, biangular behind; valves somewhat thick; beaks rather prominent; epidermis nearly black; cardinal teeth compressed; lateral teeth rather long and somewhat curved; nacre purple.

Hab. Hopeton, near Darien. Professor Shepard.
My Cabinet.
Cabinet of Professor Shepard.

Diam. ·9, Length 1·3, Breadth 2·5 inches.

Shell elliptical, transverse, somewhat inflated, inequilateral, biangular behind and rounded before; substance of the shell somewhat thick; beaks rather prominent; ligament rather short and thin; epidermis nearly black, and apparently without rays; cardinal teeth compressed, single in the right and double in the left valve; lateral teeth rather long and somewhat curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell deep; cavity of the beak rather small; nacre purple and iridescent.

Remarks.—This was among the shells procured by Professor Shepard, from near Darien, and may be considered to be between the *complanatus* (Soland.) and *confertus* (nobis). It is disposed to be more cylindrical than the former, and has a less elevated umbonial slope than the latter. The curve of the basal margin is greater than either. Possessing but a single specimen, I am unable to determine if the colour of the nacre varies in this species as it does in most of those allied to *complanatus*.

UNIO BARNESIANUS. Plate X. fig. 26.

Testâ subtriangulari, compressâ, inæquilaterali; valvulis crassis; natibus subprominulis; dentibus cardinalibus parvis; lateralibus subrectis; margaritâ albâ et iridescente.

Shell subtriangular, compressed, inequilateral; valves thick; beaks rather prominent; cardinal teeth small; lateral teeth nearly straight; nacre white and iridescent.

Hab. Cumberland River, Ten. Professor Troost.
Cabinet of Professor Troost.

Diam. ·6, Length 1, Breadth 1·4 inches.

Shell subtriangular, compressed, inequilateral; substance of the shell thick; beaks rather prominent, short; epidermis chestnut brown, with interrupted rays and strong marks of growth; cardinal teeth small, somewhat compressed; lateral teeth nearly straight, and enlarged at the posterior end; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices placed on the interior part of the plate between the cardinal and lateral teeth; cavity of the shell small; cavity of the beaks small and angular; nacre pearly white and iridescent.

Remarks.—This pretty little species is one of those for which I am indebted to Professor Troost. In its outline it very closely resembles *U. rubiginosus* (nobis). It differs from it, however, entirely in the form and size of its cardinal teeth, and in having green interrupted rays. A single specimen only has come under my observation.

UNIO ZEIGLERIANUS. Plate X. fig. 27.

Testá ellipticâ, transversâ, inæquilaterali, glabrâ; valvulis subcrassis; natibus subprominulis, undulatis; epidermide luteâ, radiatâ; dentibus cardinalibus parvis; lateralibus parvis subrectisque; margaritâ purpureâ et iridescente.

Shell elliptical, transverse, inequilateral, smooth; valves rather thick; beaks somewhat prominent, undulated; epidermis yellow, radiated; cardinal teeth small; lateral teeth small and nearly straight; nacre purple and iridescent.

Hab. Cumberland River, Ten. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.

Diam. ·6, Length 1, Breadth 1·6 inches.

Shell elliptical, transverse, inequilateral, smooth, rounded in the umbonial slope; substance of the shell rather thick; beaks somewhat prominent, with fine undulations at the tip; ligament rather short; epidermis yellow, with fine green rays on the posterior portion; cardinal teeth small, deeply cleft in the left valve; lateral teeth small and nearly straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks angular; nacre purple and iridescent.

Remarks.—This shell resembles the *U. Muhlfeldianus*, herein described, but may be distinguished at once by its being much smaller, by being more regularly elliptical, and being smoother and polished. The nacre of *Zeiglerianus*, in several specimens before me, is purple and salmon, some having a white margin. I presume the dominant colour to be purple. I have pleasure in dedicating this shell to F. Zeigler, a distinguished zoologist of Vienna.

UNIO CREPERUS. Plate X. fig. 28.

Testâ subellipticâ, transversissimâ, valdè inæquilaterali; valvulis subcrassis; natibus prominulis, undulatis; epidermide viride; dentibus cardinalibus parvis; lateralibus vix cernendis; margaritâ albâ.

Shell subelliptical, very transverse, very inequilateral; valves somewhat thick; beaks rather prominent and undulated at tip; epidermis greenish; cardinal teeth small; lateral teeth obscure; nacre white.

Hab. Tennessee. Professor Troost.
My Cabinet.
Diam. 1, Length 1·4, Breadth 2·7 inches.

Shell subelliptical, subemarginate at base, very transverse, very inequilateral, somewhat flattened over the umbones; substance of the shell thick anteriorly, thin and iridescent posteriorly; beaks rather elevated, retuse, and finely undulate at tip; ligament long; epidermis dark green and obscurely rayed; cardinal teeth small and elevated; lateral teeth obscure, being perceptible only at the termination; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the shell deep; cavity of the beak small; nacre white.

Remarks.—I owe to the kindness of Professor Troost the single valve which I possess of this species. It has some resemblance to the *U. emarginatus* (nobis), but perhaps resembles more the *U. iris* (nobis). In the structure of the teeth, particularly in the lateral tooth, the character is obscure. In this it resembles the *U. calceolus* (nobis). At the termination of the ligament there is, however, in my specimen, a well defined terminal point of the lateral tooth, and in other specimens this may be found to be more developed. The anterior lobe of the cardinal tooth is conical.

UNIO GLABER. Plate X. fig. 29.

Testâ ellipticâ, transversâ, compressâ, glabrâ, inæquilaterali; valvulis tenuibus; natibus subprominulis, undulatis; epidermide luteâ, radiatâ; dentibus cardinalibus parvis, elevatis; lateralibus longis; margaritâ albâ.

Shell elliptical, transverse, compressed, smooth and shining, inequilateral; valves thin; beaks somewhat prominent and undulated; epidermis yellow, radiated; cardinal teeth small and elevated; lateral teeth long; nacre white.

Hab. Holston River, Ten. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.

Diam. ·5, Length ·8, Breadth 1·5 inches.

Shell elliptical, transverse, compressed, polished, somewhat compressed behind, inequilateral, substance of the shell thin, somewhat thicker before; beaks somewhat prominent, with fine, nearly parallel undulations at the tip; ligament short; epidermis smooth, yellow, with numerous fine rays nearly over the whole disk; cardinal teeth small, rather compressed, elevated; lateral teeth long; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks and under the cardinal tooth; cavity of the shell shallow; cavity of the beaks small, angular; nacre white and iridescent.

Remarks.—Among the shells brought by Professor Troost from his geological exploration of the eastern part of Tennessee, was this one from the Holston. It is allied to *U. iris* (nobis), but is not so transverse. It differs also somewhat in the rays and beaks, and the epidermis is more yellow. The epidermis is smooth and polished; in these respects it resembles the young of *U. luteola* (Lam.), *siliquoideus* (Bar.).

UNIO GIBBER. Plate X. fig. 30.

Testâ triangulatâ, compressâ, inæquilaterali, posticè subbiangulatâ; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fuscâ; dentibus cardinalibus parvis; lateralibus declivibus; margaritâ salmonis colore tinctâ.

Shell triangular, compressed, inequilateral, behind subbiangular; valves rather thick; beaks somewhat prominent; epidermis dark brown; cardinal teeth small; lateral teeth inclined; nacre salmon colour.

Hab. Carryfork River, Ten. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.

Diam. ·7, Length 1, Breadth 1·8 inches.

Shell triangular, compressed, inequilateral, behind somewhat biangular, elevated on the dorsal margin; substance of the shell rather thick, thinner behind; beaks somewhat prominent; ligament short; epidermis dark brown, apparently without rays; cardinal teeth small and deeply cleft in the left valve; lateral teeth inclining towards the posterior angle; anterior cicatrices nearly distinct; posterior cicatrices distinct; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the shell very shallow; cavity of the beaks angular; nacre salmon colour and iridescent behind.

Remarks.—Among the numerous interesting species sent to me by Professor Troost, is this species from Carryfork river. In its general character it approaches the *U. crassidens* (Lam.), (*cuneatus*, Bar.). It is, however, a very much smaller shell and more triangular. All the specimens submitted to me (five) were of a fine salmon colour. It may, however, be found to vary, like the *crassidens* and *complanatus.*

UNIO VANUXEMENSIS. Plate XI. fig. 31.

Testâ ellipticâ, compressâ, transversâ, inæquilaterali; valvulis crassis; natibus subprominulis; epidermide tenebroso-fuscâ; dentibus cardinalibus magnis; lateralibus longis subcurvisque; margaritâ salmonis colore tinctâ, et iridescente.

Shell elliptical, compressed, transverse, inequilateral; valves thick; beaks somewhat prominent; epidermis dark brown; cardinal teeth large; lateral teeth long and somewhat curved; nacre salmon colour and iridescent.

Hab. Cumberland River, Ten. Professor Troost.
Cabinet of Professor Troost.
Diam. ·7, Length 1.2, Breadth 1.9 inches.

Shell elliptical, compressed, transverse, inequilateral; substance of the shell thick, thinner behind; beaks somewhat prominent, and minutely undulated at the tip; ligament rather short; epidermis dark brown, apparently without rays; cardinal teeth large and deeply cleft in the left valve; lateral teeth long and somewhat curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed across the centre of the cavity of the beaks; cavity of the shell shallow; cavity of the beaks angular; nacre salmon colour and very iridescent behind.

Remarks.—This beautiful shell is another of the fine ones obtained by Professor Troost from Cumberland River. I have peculiar pleasure in calling it after my friend Professor Vanuxem. In its general characters it perhaps most resembles the *U. Nashvillianus* (nobis), but is more compressed, less transverse, and darker coloured exteriorly. In the nacre, however, the specimen from which this description is made, differs very much, being of an intense salmon colour. In other specimens this character may be found to differ, as colour of nacre is usually in this family very uncertain.

UNIO CARBONARIUS. Plate XI. fig. 32.

Testâ subtriangulatâ, tumidâ, transversâ, inæquilaterali, subemarginatâ; valvulis crassis; natibus subprominulis; epidermide nigrâ; dentibus cardinalibus grandiusculis; lateralibus parvis subcurvisque; margaritâ purpureâ et iridescente.

Shell subtriangular, swollen, transverse, inequilateral, subemarginate; valves thick; beaks rather prominent; epidermis black; cardinal teeth rather large; lateral teeth small and somewhat curved; nacre purple and iridescent.

Hab. River Medellin, Mexico. Dr Burrough.
My Cabinet.
Cabinet of Dr Burrough.

Diam. 1·1, Length 1·4, Breadth 2·4 inches.

Shell subtriangular, swollen, transverse, inequilateral, subemarginate at the base; substance of the shell thick, thinner behind; beaks rather prominent; epidermis black, apparently without rays; ligament rather long; cardinal teeth rather large, double in the left valve; lateral teeth rather short, and widely separated from the cardinal teeth; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices placed across the inferior part of the cardinal teeth; cavity of the shell rather deep; cavity of the beaks deep and angular; nacre purple and iridescent behind.

Remarks.—The two individuals which I have before me were kindly sent by Dr Burrough, now resident United States consul at Vera Cruz. Ever prompt to promote the study of natural history, in the various climes he visits, he has sent numerous objects from Vera Cruz, with the view of increasing our cabinets and our knowledge.

The *carbonarius* has a stronger affinity to *U. crassidens* (Lam.) than any other species I am acquainted with. It is, however, a smaller shell, with more proportional diameter, and a more intense purple than I have seen in that species. The colour in the only two specimens I have seen, is almost a chocolate, and may be said to resemble the nacre of the *gibbosus* (Bar.). The black exterior and the dark interior, give the shell a very sombre aspect—hence its name.

UNIO FOLLICULATUS. Plate XI. fig. 33.

Testâ angusto-ellipticâ, transversissimâ, valdè inæquilaterâ, posticè subbiangulatâ; anticè rotundatâ; ad latera planulatâ; valvulis subtenuibus; natibus vix prominulis; epidermide tenebroso-fuscâ; dentibus cardinalibus parvis; lateralibus longis subcurvisque; margaritâ purpureâ et iridescente.

Shell narrow-elliptical, very transverse, very inequilateral, behind subbiangular, before rounded, flattened at the side; valves rather thin; beaks scarcely prominent; epidermis dark brown; cardinal teeth small; lateral teeth long and somewhat curved; nacre purple and iridescent.

Hab. Savannah River. Major Leconte.
My Cabinet.
Cabinet of Major Leconte.

Diam. ·5, Length ·8, Breadth 2·4 inches.

Shell narrow-elliptical, very transverse, very inequilateral, subbiangular behind, rounded before, rather compressed, flattened at the side; substance of the shell rather thin; beaks scarcely prominent; ligament long and curved; epidermis very dark brown; cardinal teeth small and lobed; lateral teeth long and somewhat curved; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the shell small; cavity of the beak very small; nacre purple and iridescent.

Remarks.—I owe the possession of this species to Major Leconte, whose active researches in the rivers of Georgia have produced us several new *Uniones.*

The *folliculatus* is a remarkably transverse shell, and seems to belong to that group of which the *complanatus* (Soland.) may be considered the type. It diverges towards the *Shepardianus* (nobis), but is by no means so transverse a species. The only two specimens which I have seen, are purple inside, which may be considered its general colour. Like the *complanatus,* it may perhaps be found white and salmon coloured.

UNIO MEDELLINUS. Plate XII. fig. 34.

Testâ ellipticâ, transversâ, subcompressâ, inæquilaterali; valvulis subtenuibus; natibus subprominulis; epidermide luteolâ, radiatâ; dentibus cardinalibus parvis; lateralibus longis subcurvisque; margaritâ albâ et iridescente.

Shell elliptical, transverse, rather compressed, inequilateral; valves somewhat thin; beaks rather prominent; epidermis yellowish, radiated; cardinal teeth small; lateral teeth long and somewhat curved; nacre white and iridescent.

Hab. River Medellin, near Vera Cruz. Dr Burrough.
My Cabinet.
Cabinet of Dr Burrough.

Diam. ·7, Length 1·3, Breadth 2·3 inches.

Shell elliptical, transverse; rather compressed, subemarginate at base, inequilateral; substance of the shell rather thin; beaks rather prominent; ligament rather long and slender; epidermis yellowish, with numerous green rays over the whole disk; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell shallow; cavity of the beaks very shallow; nacre white and iridescent.

Remarks.—This species was among those sent by Dr Burrough from Vera Cruz. One of the two specimens received is apparently only half grown. The very strong resemblance these specimens bear to *U. radiatus* (Gmelin), has caused me to hesitate in considering the species distinct. The younger individual is more transverse than any specimen of *radiatus* I have seen, and the emargination is a character which that shell does not possess.

UNIO LECONTIANUS. Plate XII. fig. 35.

Testâ ellipticâ, transversâ, inæquilaterali, subinflatâ; valvulis crassis; dentibus cardinalibus parvis; lateralibus longis, à cardinalibus separatis; margaritâ salmonis colore tinctâ.

Shell elliptical, transverse, inequilateral, somewhat inflated; valves thick; cardinal teeth small; lateral teeth long, being separated from the cardinal teeth; nacre salmon colour.

Hab. Conoochee River, Georgia. Major Leconte.
My Cabinet.
Cabinet of Major Leconte.

Diam. 1·2, Length 1·7, Breadth 2·8 inches.

Shell elliptical, transverse, inequilateral, subbiangular behind, somewhat inflated; substance of the shell thick; beaks slightly elevated; ligament rather short; epidermis yellowish brown and obscurely rayed; cardinal teeth small and deeply cleft in the left valve; lateral teeth long, enlarged at the posterior end, and separated from the cardinal teeth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the plate between the cardinal and lateral teeth; cavity of the shell somewhat deep and rounded; cavity of the beak small; nacre salmon colour, approaching to white.

Remarks.—Among many other shells from Georgia, which I owe to the kindness of my friend, Major Leconte, I found this species, which I believe has not been before described. It is with great pleasure I dedicate it to him. The *Lecontianus* perhaps most resembles the *crassidens* (Lam.), *cuneatus* (Barnes). It is not so large a shell, and the beak is more medial. The young specimens have distinct rays, and their epidermis is quite yellow. In this state they resemble somewhat the young of *crassus* (Say). The nacre of all the specimens I have seen is salmon colour, and salmon running into white or purple. None of the beaks were sufficiently perfect to observe the form of undulations.

UNIO MUHLFELDIANUS. Plate XII. fig. 36.

Testâ ellipticâ, subcompressâ, transversâ, inæquilaterali; valvulis subcrassis; natibus subprominulis, undulatis; epidermide luteolâ radiatâ; dentibus cardinalibus subparvis erectisque; lateralibus longis rectisque; margaritâ albâ et iridescente.

Shell elliptical, rather compressed, transverse, inequilateral; valves rather thick; beaks somewhat prominent, undulated; epidermis yellowish, radiated; cardinal teeth rather small and erect; lateral teeth long and straight; nacre white and iridescent.

Hab. Cumberland River, Ten. Professor Troost.
Cabinet of Professor Troost.

Diam. ·8, Length 1·3, Breadth 2·3 inches.

Shell elliptical, rather compressed, transverse, inequilateral, rounded before and behind, flattened on the umbonial slope; substance of the shell rather thick before, thinner behind; beaks somewhat prominent, with fine undulations at the tip; ligament long; epidermis yellowish, with dark green rays on the posterior portion; cardinal teeth rather small, erect, and deeply cleft in the left valve; lateral teeth long and straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks angular; nacre white and very iridescent behind.

Remarks.—The specimen before me was brought from the Cumberland River by Professor Troost, but I do not know from what part of it. It seems to be more closely allied to *U. iris* (nobis) than any species I have seen, but differs in being less transverse, more flattened out behind, and in having the rays more distinct on the posterior portion. I dedicate it to the distinguished custos of the Imperial Museum at Vienna.

A single valve closely resembling this species was sent to me sometime since by my brother, T. G. Lea, from Cincinnati, but it is not sufficiently perfect to decide on its being the same.

MARGARITANA HOLSTONIA. Plate XIII. fig. 37.

Testâ subarcuatâ, subinflatâ, transversâ, valde inæquilaterali; ad latus planulatâ; valvulis subtenuibus; natibus subprominulis, undulatis; epidermide fuscâ; dentibus cardinalibus magnis; margaritâ albâ et iridescente.

Shell subarcuate, somewhat inflated, transverse, very inequilateral, flattened on the side; valves rather thin; beaks somewhat prominent, undulated; epidermis brown; cardinal teeth large; nacre white and iridescent.

Hab. Holston River. Professor Troost.
Cabinet of Professor Troost.
Diam. ·8, Length 1·2, Breadth 2·4 inches.

Shell subarcuate, somewhat inflated, transverse, very inequilateral, flattened on the side, rounded on the umbonial slope; valves rather thin, thicker before; beaks somewhat prominent, irregularly and finely undulated at the tip; ligament rather long; epidermis brown, wrinkled, and apparently without rays; cardinal teeth large, and elevated into three points in the left valve, smaller in the right valve, and elevated into a single point; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices placed on the inferior portion of the cardinal teeth; cavity of the shell rather deep; cavity of the beak shallow and angular; nacre white and iridescent.

Remarks.—This species is the production of Holston River, but I am not aware from what part it was procured by Professor Troost, to whose kindness I owe the privilege of describing it. It is more nearly allied to the *M. Raveneliana* (nobis) than any other species of this genus. It may be distinguished from it by its being more compressed, in the form of its teeth, and in being without rays. The last character must, however, be received with some doubt, as specimens may be found with rays. The single specimen before me having no rays, does not prohibit their occurrence in others. The teeth of the left valve are remarkable in being elevated into three distinct points, the two posterior ones clasping into the cavity of the beak of the other valve.

MARGARITANA DELTOIDEA. Plate XIII. fig. 38.

Testâ triangulatâ, compressâ, inæquilaterali; valvulis tenuibus; natibus prominentibus, ad apices undulatis; epidermide luteâ, radiatâ; dentibus cardinalibus erectis; margaritâ albâ et iridescente.

Shell triangular, compressed, inequilateral; valves thin; beaks prominent, undulated at the tip; epidermis yellow, radiated; cardinal teeth erect; nacre white and iridescent.

Hab. Ohio River, near Cincinnati. T. G. Lea.
Scioto. Dr Kirtland.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Dr Kirtland.

Diam. ·6, Length ·9, Breadth 1·4 inches.

Shell triangular, compressed, inequilateral, subemarginate at base; substance of the shell thin behind, thicker before; beaks prominent and strongly undulated at the tip; ligament short and thin; epidermis yellow, with numerous green rays, which are deficient at the beaks; cardinal teeth erect, double in the left valve, single and conical in the right; lateral teeth obsolete; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the shell not deep; cavity of the beaks rather deep and angular; nacre white and iridescent.

Remarks.—This little shell has engaged my attention for some time, having considered it, with a good deal of doubt, a variety of *U. calceolus* (nobis). Like that shell it has a very imperfectly formed lateral tooth; in most individuals it cannot be perceived. In comparison with the *calceolus*, it is more triangular and flattened, and the undulations of the beaks are unbroken. The beaks are of a darker colour, and the anterior lobe of the cardinal teeth seems to be larger in this, while in the other the posterior seems to be the larger. The *deltoidea* is also a smaller shell.

MARGARITANA FABULA. Plate XIII. fig. 39.

Testâ suboblongâ, transversâ, inæquilaterali, ad basim emarginatâ, ad latus planulatâ; valvulis subcrassis; natibus prominulis; epidermide subviridi; dentibus cardinalibus parvis erectisque; margaritâ salmonis colore tinctâ.

Shell somewhat oblong, transverse, inequilateral, emarginate at base, flattened on the side; valves somewhat thick; beaks rather prominent; epidermis greenish; cardinal teeth small and erect; nacre salmon colour.

Hab. Cumberland River, Ten. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.

Diam. ·4, Length ·5, Breadth ·8 of an inch.

Shell somewhat oblong, transverse, inequilateral, somewhat inflated, emarginate at base, flattened on the side, raised at the umbonial slope; substance of the shell rather thick, thinner behind; beaks rather prominent; epidermis greenish, with indistinct rays; ligament short; cardinal teeth small and erect; anterior cicatrices confluent; posterior cicatrices distinct; dorsal cicatrices placed on the under part of the cardinal tooth; cavity of the shell deep; cavity of the beaks angular; nacre salmon colour, lighter before.

Remarks.—This curious and interesting shell I owe, with many others, to my friend Professor Troost. It is much smaller than any species which has been heretofore described, and does not seem to approach very closely any other species in its general characters. The two specimens which are now before me, the only ones I have seen, are much eroded. This prevents my knowing if the beaks be, in a perfect state, furnished with undulations.

ANODONTA CYLINDRACEA. Plate XIII. fig. 40.

Testâ cylindraceâ, inflatâ, valdè transversâ, inæquilaterali; valvulis tenuibus; natibus subprominulis; epidermide tenebroso-fuscâ, radiatâ; margaritâ cœruleâ.

Shell cylindrical, inflated, very transverse, inequilateral; valves thin; beaks somewhat prominent; epidermis dark brown, radiated; nacre blue.

Hab. River Medellin, near Vera Cruz. Dr Burrough.
My Cabinet.
Cabinet of Dr Burrough.

Diam. ·9, Length 1·3, Breadth 2·3 inches.

Shell cylindrical, inflated, very transverse, inequilateral, flattened on the umbones, subbiangular behind; umbonial slope rounded; substance of the shell thin; beaks somewhat prominent; ligament long and slender; epidermis dark brown, with numerous capillary rays over the whole disk; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices not perceptible; cavity of the shell large; cavity of the beaks small; nacre blue and iridescent.

Remarks.—Two specimens only of this were sent by Dr Burrough. The one figured appears to be mature and in a good state; the other is young and imperfect. In outline it differs from any species within my knowledge. In the nacre it somewhat resembles the *A. tenebricosa* (nobis), but is a much thinner and more transverse shell. The deposit of epidermal matter in the interior, gives it a very clouded appearance. It is highly iridescent on the posterior portion of the nacre.

ANODONTA SALMONIA. Plate XIV. fig. 41.

Testâ ellipticâ, transversâ, inflatâ, valdè inæquilaterali; valvulis tenuibus; natibus prominulis; epidermide tenebroso-fuscâ; margaritâ colore salmonis tinctâ, infernè cœruleâ.

Shell elliptical, transverse, inflated, very inequilateral; valves thin; beaks somewhat prominent; epidermis dark brown; nacre salmon colour, bluish along the base.

Hab. near Poland, Ohio. J. P. Kirtland, M.D.
My Cabinet.
Cabinet of Dr Kirtland.
Cabinet of Mr Hyde.

Diam. 1·1, Length 1·4, Breadth 2·7 inches.

Shell elliptical, transverse, inflated, very inequilateral, within salmon colour and usually very rough; substance of the shell thin; beaks somewhat prominent and slightly undulated at the tip; ligament rather short; epidermis dark brown, sometimes with yellow bands; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices indistinct; cavity of the shell deep; cavity of the beaks shallow; nacre bluish along the inferior margin, the interior being usually rough and of a deep salmon colour.

Remarks.—I am indebted to Dr Kirtland, of Poland, Ohio, for several specimens of this singular *Anodonta.* It is remarkably characterized in the nacre by the rough or tuberculous deposit of a deep salmon colour. In my specimens this roughness is exhibited most strongly about the anterior cicatrices. In form it most resembles the *A. Ferussaciana* (nobis), but is not quite so cylindrical, and differs altogether in the interior.

ANODONTA WARDIANA. Plate XIV. fig. 42.

Testâ ellipticâ, transversâ, subinflatâ, inæquilaterali; clivo umboniali rotundato; valvulis tenuibus; natibus prominentibus, ad apices undulatis; epidermide viridi, radiatâ; margaritâ subcæruleâ.

Shell elliptical, transverse, somewhat inflated, inequilateral; umbonial slope rounded; valves thin; beaks prominent, undulated at the tip; epidermis green, rayed; nacre bluish.

Hab. near Chilicothe, Ohio. J. C. Ward, M.D.
My Cabinet.
Cabinet of Dr Ward.

Diam. 1·2, Length 1·7, Breadth 3 inches.

Shell elliptical, transverse, somewhat inflated, inequilateral, at the base subemarginate, dorsal margin curved under the beak; umbonial slope rounded; substance of the shell thin; beaks prominent, concentrically undulated at the tip; ligament rather short; epidermis green, disposed to be yellow on the posterior slope and the beaks; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices indistinct; cavity of the shell large; cavity of the beaks angular; nacre bluish.

Remarks.—I have from time to time received specimens of this species from Ohio, but I owe the perfect ones, now before me, to Dr Ward, of Chilicothe. Aware of its resemblance to *An. Ferussaciana* (nobis), and *An. areolatus* (Swainson), that gentleman gave particular attention to its habits, and in his letter to me, comparing it to the latter, which it most resembles, he says: "It more nearly resembles a variety of *areolatus* than any other species. It, like that shell, has the strong bend under the beak, which in the *areolatus* is almost a tooth. In habit, it totally differs from *areolatus*. It pierces deeply in the clay and gravel banks, in which it resembles the *An. incerta*, while the *areolatus* is only found in the deep bed of the stream, and is partially uncovered." In the undulations of the beaks, it more resembles the *Ferussaciana*, these being larger in the *areolatus*.

ANODONTA BUCHANENSIS. Plate XIV. fig. 43.

Testâ transversâ, inflatâ inæquilaterali, infernè emarginatâ, ad latus planulatâ; clivo umboniali elevato; valvulis tenuibus; natibus prominulis; apicibus undulatis; epidermide subviridi; margaritâ albâ.

Shell transverse, inflated, inequilateral, emarginate at base; flattened on the side; umbonial slope elevated; valves thin; beaks somewhat prominent, undulated at the tip; epidermis greenish; nacre white.

Hab. Buck Creek, Ohio. R. Buchanan, Esq.
My Cabinet.

Cabinet of Mr Buchanan.

Diam. 1·1, Length 1·3, Breadth 3 inches.

Shell transverse, inflated, subcylindrical, inequilateral, emarginate at the basal margin, flattened on the sides; umbonial slope elevated and rounded; substance of the shell thin; beaks somewhat prominent and minutely undulated at the tip; ligament rather short and thin; epidermis greenish, darker on the posterior slope; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices indistinct; cavity of the shell deep; cavity of the beaks shallow; nacre white, bluish on the posterior part.

Remarks.—I owe to the kindness of R. Buchanan, Esq., a single specimen of this shell. It approaches the *A. Ferussaciana* more nearly than any other of our *Anodontæ* with which I am acquainted. In this individual the beaks are of a bright rusty colour.

Continuation of Mr Lea's Paper. Read, July 15th, 1837.

Having for some years given much attention to the anatomical structure of the *Naïades*, I have arrived at some results which may be deemed important enough to attract the further attention of zoologists, and be of sufficient interest to merit a place in our Transactions.

It is a source of congratulation to those interested in the study of this branch of natural history, to find that a number of naturalists are giving their time to examinations in localities peculiarly and fortunately situated in regard to the number of species, as well as their size, which circumstances tend greatly to facilitate investigations.

Believing that the oviducts would present to us the means of discrimination in some of the species, having found them to be so very different in the *Unio irroratus*,* my attention had been particularly addressed to these organs in the few and small species of our vicinity.

While engaged in this investigation, I received a communication from Dr Kirtland of Poland, Ohio, an ardent and intelligent student of natural history, in which he informed me of his conviction of being able to distinguish the female and male shells of the same species, without recourse to the included animal. Very shortly after this, his conclusive article on this subject appeared in the American Journal of Science and Arts, Vol. XXVI. It had been a matter of common observation, that individuals of the same species differ very much in the outline of the posterior portion of the shell. In some cases this has been the sole cause of making species, and *apparently* with reason.

It has generally been believed by European naturalists, as well as those of our own country, that these animals were androgynous, a principle so repugnant to nature, that it ought to have excited stronger doubts where the animal structure was so high in the scale of nature, as is the *Naïades.*

My attention now became more addressed to sexual characters, and a very short series of examination satisfied me fully as to the establishment of the difference of sexes.

The female sustaining her very large burden, naturally requires more space within the valves—hence we generally find an enlargement of the posterior portion of the shell, differing in its form in various species.

In the *U. cariosus, ochraceus, radiatus, luteolus, occidens, purpuratus, &c.*, the female is less transverse than the male, being somewhat truncate at the posterior margin, and the greatest diameter is near this portion of the shell. In the species having this distinction, the oviducts will be found to be placed in the posterior portion of the branchiæ. (See Pl. XV., fig. 44, 45, representing the oviducts of *cariosus* and *ochraceus.*) On reference to the figure of *cariosus* (Say), in Nich. Ency. (Am. Edit.) art. Conch. Pl. III., fig. 2, the female character is evident. The *occidens* (nobis), Trans. Am. Phil. Soc., Vol. III. Pl. X., is female; and *purpuratus* (Lam.), *ater* (nobis), Vol. III. Pl.

---

* See Vol. I., p. 13.

VII., is undoubtedly such. It may be observed, in each of these figures, that there is an enlargement at the posterior basal margin. This, so far as my knowledge extends, is always indicative of the female character in this form of shells, and this enlargement of the valve corresponds with the position of the charged oviducts. In the *cariosus* I have observed frequently, that the oviducts were so full as to be protruded when the animal was at rest, and when disturbed it retracted them with sluggishness. In a single case of a female *radiatus* which I touched in the river, the oviducts were visibly outside of the line of the shell, and the sudden alarm caused so rapid a closing of the valves as to cut off several of the sacks, which floated away.

There are a few species very remarkable in the shell for a character, which I refer to sex entirely, but never having had the advantage of examining the anatomy of the included animals, I do not present it as an undoubted fact. In my description of *U. arcæformis*, Trans. Am. Phil. Soc., Vol. IV., page 116, I noticed the enlargement and dentate appearance of the posterior margin. In this species, the *brevidens*, *sulcatus*,* *capillaris*, and *triangularis*,† we find an enlargement to commence at a middle age before or along the umbonial slope, and each mark of growth on this enlargement is disposed to be dentate. In the *brevidens* it is so abrupt as to resemble a large cord on the inferior portion of the valves. In the *arcæformis* it is somewhat flattened and but slightly influences the plane of the margin. In the *capillaris* it is more spread out, but the enlargement and dentition are still very perceptible. One of my specimens of the *sulcatus* presents the dentitions more complete than I have observed in any other species. In all the species where this enlargement takes place, a corresponding groove may be observed in the interior part of the valve. In corroboration of my conclusion, that these are female shells, we have specimens of full growth of undoubtedly the same species which have not the least appearance of an enlargement; and all those which have not attained more than one-third or half their growth never in any case present it.

---

* See my remarks, Vol. I., p. 45.

† The male differing so much in form in the posterior part, induced me to think it to be a distinct species, and as such, I described it in Vol. I., p. 121, under the name of *formosus*. See Plate XVI., fig. 41.

On examining the peculiarity of this structure, we are led to the conclusion, that these grooves are adapted to the enlargement of the oviducts, and I have no hesitation in believing, that when the animal shall be examined, it will be found to be adapted to this structure. In a former memoir, Vol. III. p. 271, I have described the very curious conformation of the oviducts of the *irroratus.* No species which has come under my notice since, presents any thing resembling it. The situation of the oviduct being about the centre of the valve, we do not find that the form of the margin is changed by its sexual character. The *phaseolus* (Hildreth) presents a very peculiar arrangement of the oviducts, resembling no other species which I have examined. The line of the branchiæ being very long, a continued folding of the whole length seems to be necessary. This is accurately represented in Mr Say's "American Conchology," plate 22. In the few female specimens of this species which I have examined, I have not been able to notice a difference of form in the shell from the male.

The females of the *U. perplexus* and *capsæformis*, are distinguished by a remarkable spreading out and extension of the whole of the posterior part of the shell. This very naturally has been taken for a deformity.

So far as I have been able to examine the *Anodontæ*, I have found them to differ in their structure as regards the oviducts. They do not appear to be divided into sacks like the *U. ochraceus*, *cariosus*, *&c.*, but to present an even mass from the anterior to the posterior part. I have examined numerous individuals of the two species, *An. fluviatilis** and *undulata* (Say), which exist in our vicinity, and several *Ferussaciana* (nobis), of the western waters which have been sent to me by my brother, T. G. Lea, in a preserved state. The whole lobe of the superior *branchiæ* being charged with ova, I presume that the *Anodontæ* produce more young than the *Uniones*. In October 1834, I examined a large number of our two species from the Schuylkill, and found the females very much advanced in gestation. The specimens of *fluviatilis* (see Plate XV. fig. 46), apparently, were ready to discharge their burdens. By the pressure of the finger on the side of the oviducts, the young and perfect shells, lying as closely as possible, came from the orifices at the inferior part of the lobe. This I considered conclusive as regards this species, but I have not been able to decide so satisfactorily as to the mode of the *Uniones* discharging their young. I have been in the habit of keeping many living specimens in water, that I might observe them at convenience, and have placed them so near the surface of the water, in basins, as to examine their oviducts with a good lens. In one case, only, have I seen any discharge, and this was in a good sized *complanatus*, which sent out, while I watched it, perhaps a dozen sacciform oviducts in quite a quick succession. My draughtsman, Mr Drayton, happened to be in my room at the time, and witnessed this operation. Frequently, since that period, I have endeavoured to obtain the same result, but in no case has it recurred. I have, therefore, had my doubts (although I then considered it conclusive) whether it might not have been the effect of accident arising from the unnatural position of the animal—perhaps weakness or approaching dissolution. The *An. undulata* (see Plate XV. fig. 47) seemed nearly ready to spawn. The following observations were made on one which was kept, and opened December 21. The mass of the lobes in this species differs from the *fluviatilis*, in presenting a darker appearance and a very curious arrangement of the oviducts. The ova are placed in a kind of sack which lie across the lobe, presenting one end to the stomach and the other to the mantle of the animal. They lie so close together, as to take the form, on the exterior, like the cells of the honeycomb. This is, of course, caused by pressure. Some of these sacks, when carefully removed, were found to contain as many as twelve ova, each with a perfect living shell in it, having a brownish epidermis.

---

* *Myt. fluviatilis* (Soland.); *An. cataracta* (Say).

Fig. *a*, represents a sack with its ova.

Fig. *b*, represents the ovum with its perfect young shell included.

Fig. *c*, represents the honeycomb appearance, and is eight times magnified.

Among the species which I had under examination, were numerous specimens of *U. radiatus*, and, very much to my surprise, I found the females putting on two quite different forms as regards the inferior posterior portion of the mantle.

Plate XV., fig. 48, represents a female, with the parts protruded, as she lay at the bottom of a basin of water. The inferior portion of both sides of the sacciform branchiæ are visible, and bordered with black. The fringe of the mantle bordering this portion is furnished with brownish palpi, of one-eighth to three-eighths of an inch long, the two longest being the anterior ones, and opposed to each other. This part of the mantle is in frequent motion, as if in the action of throwing the water on the oviducts.

Plate XV., fig. 49, exhibits a very different apparatus for this part of the mantle. In the place of the palpi, we have a gray, spotted, fleshy ciliate prolongation of the mantle, which terminates in two long flexible feelers, nearly an inch long. At the posterior end of this portion there is a remarkable black spot on each side, surrounded by a white ring, presenting an extraordinary resemblance to an eye.

The difference between these two forms of the same portion of the mantle of the *radiatus* is truly curious. It seems difficult to believe it possible that they should not differ specifically. In the characters of the shells, however, I can find no difference whatever, and no one has, I believe, thought of dividing the *radiatus* of our rivers. Further investigation may throw some light on this apparent deviation in nature, and I trust the attention of the observant naturalist will be given to it. Circumstances have prevented me from following up these examinations, but it is my intention to resume them again.

I had commenced with the examination for sexual character with a good deal of ardour, and intended to have carried this through every month of the year, so far as the seasons permitted. The circumstances alluded to above, prevented the execution of this being as complete as I desired, and I propose to give extracts from my notes, rather than at present to draw conclusions.

Oct. 12, 1834.—I opened a large number of shells from the Schuylkill.

Twenty-five *U. complanatus.* These were all found to be without charged oviducts!!

Eleven *U. nasutus.* Four were found to be females, seven males.

Twenty-four *U. cariosus.* Ten were found to be females, fourteen males.

Twenty-four *U. ochraceus.* Ten were found to be females, fourteen males.

Six *Margaritana undulata.* One was found to be a female, five males.

One *Margaritana marginata.* Sex female.

Four *Anodonta undulata.* One was found to be a female, three males.

Six *Anodonta fluviatilis.* Three proved to be females, three males.

Oct. 23, 1834.—Opened a fine specimen of *Marg. marginata* and found the oviducts forming a lobe like the *An. fluviatilis*, there being no apparent sacks, but the whole mass was largely distended. The foot and surrounding portions were found to be of a salmon colour, as well as the edge of the mantle, which diminishes in intenseness as it approaches the sides and back. The perfect shells could be observed, but they were not so far advanced as to be yet brown.

Opened five specimens of *Marg. undulata.* Only one had charged oviducts, which were found to be similar to the above, but not quite so far advanced. Termination of the foot slightly salmon colour.

Opened two *U. ochraceus.* One male, the other female. The latter fully charged.

Nov. 16, 1834.—Examined three specimens of *U. cariosus*, all obtuse at posterior end.—Found them all fully charged.

Two *U. ochraceus.* Obtuse. Fully charged.

One *U. radiatus.* Obtuse. Fully charged.

One *U. nasutus.* Obtuse. Just commenced to swell on the border of the branchiæ.

Two *U. complanatus.* Both males.

Two *M. undulata.* Both males.

Two *An. fluviatilis.* One male, one female.

Dec. 24, 1834.—Opened the following shells, which had been kept in water some four, some twelve weeks, in the house.

Four *U. cariosus.* One female, three males.

Three *U. complanatus.* All without charged oviducts.

Two *M. marginata.* Without charged oviducts.

Two *M. undulata.* Without charged oviducts.

One *An. undulata*, with reddish charged oviducts, displaying, in a beautiful manner, the honeycomb appearance.

Jan. 18, 1835.—Re-examined a keg of *Naïades*, received from T. G. Lea, two years since. Found *An. Ferussaciana* to be charged in its oviducts like *An. undulata.* One *U. calceolus* partly charged, and one fully charged. One *U. parvus*, thickened along the edge of the oviduct, but did not appear to be perfectly developed. One *An. edentula* was found charged like *An. undulata.*

Jan. 25, 1835.—Opened a large keg from T. G. Lea, taken near Cincinnati. *U. cornutus* was found to differ in its form of the oviducts from other species, the sacks being inclined, and lying parallel to each other, and pendent to the posterior part of the branchiæ only. *U. trigonus*, animal of a deep nearly red colour. *U. Æsopus*, orange colour. *U. cylindricus*, colour pale orange with a blackish line along the lower part of the foot. *U. securis* was found with the oviducts like *cariosus. Sym. complanata*, colour fine orange. *U. ovatus*, very like to *cariosus* in the oviducts. *Sym. gracilis*, oviducts like *cariosus*, but much finer and closer. *U. triangularis*, oviducts small and somewhat like *cariosus*, but more oblong and bent in. *U. foliatus* had small oviducts.

U. clavus,[*] found the animal to be orange colour.

U. retusus, has oviducts on the posterior part of the branchiæ only; they resemble those of *cariosus*, but are smaller.

U. ellipsis. The oviducts are like *retusus.*

U. orbiculatus, has oviducts like *cariosus.*

U. rectus, has oviducts close to the posterior end.

March, April, May 1835.—During these months numerous specimens were examined, which confirmed my previous observations.

May 26.—I opened a keg containing various species, from Cincinnati the preceding autumn.

Twenty *An. Ferussaciana.* Seventeen had charged oviducts.

Four *An. incerta* were apparently all males.

---

[*] *Scalenius?* (Rafinesque).

Three *An. edentula.* All had charged oviducts.

Four *Unio calceolus.* All had charged oviducts.

One *Unio planulatus.* Oviducts charged.

Four *Unio luteolus.* Two with charged oviducts.

Several *Unio crassus.* Only one with charged oviducts.

A few specimens of *multiplicatus*, *tuberculatus*, *asperrimus*, *crassidens*, *alatus*, *gracilis*, &c., proved to be without oviducts; doubtless all being male.

July 1835.—During this month examined some fifty or sixty specimens of various species, in none of which did I find the oviducts charged.

Aug. 11, 1835.—Received three fine specimens of *U. heterodon* from Mr Clark, of Manayunk. One of these was found to be charged nearly the whole length of the branchiæ with ova. These were so small as to require the microscope to make them out.

Sept. 6, 1835.—Opened a specimen of *U. heterodon*, found a few days since in the Schuylkill. The oviducts were charged nearly the whole length of the branchiæ, and the ova very perceptible with the microscope.

Sept. 11, 1835.—Examined another *U. heterodon*, and found it similar to the last mentioned.

Sept. 13, 1835.—Opened a number of various species. Found three *An. undulata*, with their oviducts charged, being sufficiently forward to exhibit very plainly their singular position across the lobe of the branchiæ. Also four *Marg. undulata*, with charged oviducts, but by no means in a forward state.

Dec. 13, 1835.—Examined a large *Marg. margaritifera*, which proved to be without oviducts. Had a strong dorsal muscular attachment. The palpi along the fringe of the mantle were more grouped than those which I have observed on the *Uniones.* On the branchiæ were spots of a nankin yellow colour, quite consistent, but yielding to the pressure of the knife.

Also a large *Marg. marginata*, nearly three inches in width. This had oviducts filled with minute ova, just perceptible with the microscope. These two fine specimens were taken for me in Crum Creek, by Dr Griffith. Also examined a *U. radiatus*, with enlarged oviducts, but not sufficiently advanced to observe any ova with a common microscope. Several others examined proved to be males.

June 5, 1836.—Opened an obtuse *U. ochraceus*, with large and full oviducts. The ova only so far progressed as to be visible with the microscope.

Unio spinosus. Plate XVI. fig. 50.

Testâ spinosâ, subtriangulari, inflatâ, inæquilaterali, posticè acuto-angulatâ; valvulis subcrassibus; clivo umboniali carinato; natibus vix prominentibus; epidermide atro-fuscâ, glabrâ; dentibus cardinalibus deorsum inclinantibus; lateralibus subgrandibus subcurvisque; margaritâ purpureâ.

Shell spinous, subtriangular, inflated, inequilateral, acutely angular behind; valves rather thick; umbonial slope carinate; beaks scarcely prominent; epidermis dark brown, shining; cardinal teeth inclining downwards; lateral teeth rather large and curved; nacre purple.

Hab. Altamaha, Hopeton, near Darien, Geo. James Hamilton Cowper, Esq.

Hab. Altamaha, Liberty County, Geo. Lewis Leconte, Esq.

My Cabinet.
Cabinet of Professor Shepard.
Cabinet of Professor Ravenel.
Cabinet of Major Leconte.

Diam. 1·2, Length 1·8, Breadth 3·3 inches.
From tip to tip of fourth pair of spines, 2·6 inches.

Shell spinous, subtriangular, inflated, inequilateral, acutely angular behind; arcuate on the dorsal margin; substance of the shell rather thick, thinner behind; spines erect, opposed in each valve, placed in a row before the umbonial slope and nearly parallel thereto; umbonial slope carinate; beaks scarcely prominent; ligament short and thick; epidermis dark brown, shining, finely wrinkled; cardinal teeth inclining downwards, single in the right and double in the left valve, enlarged and truncate at the anterior end; lateral teeth rather large, thickened and curved in the inferior portion; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the inferior part of the cardinal teeth; cavity of the shell deep; cavity of the beaks angular; nacre purple.

Remarks.—The genus *Unio* has particularly attracted the attention of naturalists, in the fact of its presenting specimens which resemble many of the genera and species of other families. Thus we have them to resemble an *Arca*, a *Venus*, a *Solen*, a *Modiolus*, &c. The shell described above resembles that which I never expected to see in the *Naïades*, viz. the *Cytherea Dione!* The *Unio spinosus* is certainly the most extraordinary species of this genus which has come under my notice. Having seen but a single specimen, I am not prepared to say that the number of spines is uniform. There are apparently four pairs. I say apparently, for I find no antagonist spine on the right valve opposed to that nearest the tip of the beak. The beak being slightly eroded there, may account for its absence. That which remains on the left valve, nearly a quarter of an inch from the tip of the beak, is only one-tenth of an inch long, but, being fractured, may have been originally much larger. This I call the first pair.

The second pair is placed nearly half an inch from the same point, and the spines directly opposite to each other. That on the left valve is half an inch long, but, being fractured at the apex, most likely was, in a perfect state, one-tenth of an inch longer. At the base it is nearly one-tenth of an inch thick, at the top one-twentieth. That of the right valve is about four-tenths of an inch long, and bifurcates two-thirds of the way up, at an angle of nearly forty degrees, the apex of each branch being fractured.

The spines of the third pair are not exactly opposed to each other, but this I attribute to accidental causes in this specimen. In the left valve the spine is placed nearer to the umbonial slope than those which are next to it, while that of the right valve is further removed from it; consequently neither stand exactly in the line of the row of the whole on each valve. That of the left valve is broken off three-tenths of an inch from its base; that of the right valve is six-tenths of an inch, and presents the only perfect apex of a spine. This apex is rounded, perfectly smooth, and covered over with epidermal matter.

The fourth pair is nearly three-fourths of an inch from the third, and the spines are much thicker and stronger, and are both rather over half an inch long; that of the left valve bifurcates near the top, and a little lower down there is the rudiment of a third branch; that of the left valve presents no bifurcation, but has the rudiment of a branch at the same height as that of the other valve. All the spines are flattened, the greater diameter being transverse—their upper sides are wrinkled, and particularly those of the inferior pair—their lower sides flattened and smooth. This is exactly what we might expect in the formation of these spines. They are constructed like the tubercles on the nodulous shells and the horns on the *cornutus.* The border of the mantle having deposited the calcareous matter, and the epidermal matter over it, outside of the plane of the shell, where the base of the spine is placed, continues to do this until the apex of the spine is reached. We would then have the larger longitudinal part finished, with its epidermis complete, and the centre would form a kind of channel to the apex. This being reached, the mantle forms the same operation, descending in the lower side, filling up the channel, and covering the deposit with epidermis, and presenting somewhat the appearance of a cicatrix. All the spines which are broken display the remains of the channel, and at first view might be thought to be perforate. This, however, is not the case; the interior of the valves indicating no appearance of the position of the spines, except a little roughness below the last pair.

The teeth of this shell differ in some of their characters from any *Unio* with which I am acquainted. The highest part of the dorsal curve is equidistant from the extreme ends of the two teeth. The cardinal teeth are remarkable for their form and position, being very much enlarged at the anterior end, and pointing to the anterior margin. The lateral teeth are lamellar, and unusually enlarged on the inferior portion—thus forming an inverted curve, the inferior portion of the double lamellar tooth being very much larger than the superior one.

The nacre of the shell is purple, approaching a rose colour, and is very beautiful. The beaks being slightly eroded, renders it unable to determine if there be any undulations there. I doubt when perfect specimens are found, if there will be any observed.

The above description and observations being made under the disadvantage of the examination of a single specimen only, it is proper to mention that they may not apply to all. It is very probable that some individuals may have no bifurcation of the spines, while others may have all the spines possessing that character. The colour of the nacre may also vary. Professor Shepard informs me that two other specimens, now in the cabinet of Professor Ravenel, were quite imperfect. "One of them had but two (nearly obliterated) pairs of spines, and the other but a single pair. The shells being eroded in the vicinity of the spines, all traces of them had disappeared. The largest specimen was one-third larger than that now sent."

The existence of this curious species was first communicated to me by Major Leconte, in 1830 or 1831, and he then very kindly promised to procure it for me through his brother. In a letter recently received from him, he says, "I first heard of, and in fact saw, a fragment of the *Unio spinosus* in the year 1830, as being found, along with several other species (of which single valves were given to me), in the Altamaha River. Since then my brother (Lewis Leconte) has repeatedly endeavoured to obtain specimens of it, without success, until last winter. He once went to the situation where they are most plentifully found (a distance of fifty miles, and in an almost uninhabited country), but failed in procuring any."* About two years after Major Leconte first called my attention to this shell, I found that it had been observed by Bartram in his "Travels." In the summer of 1777 he seems to have observed it in the Mississippi. If it be not the same species, it must be very like it. He says, "The next morning I set off for Point Coupé; passed under the high pointed cliffs, and then set our course across the Mississippi, which is here near two miles over; touched at a large island near the middle of the river, being led there, a little out of our way, in pursuit of a bear crossing from the main. After resting a while, we re-embarked, and continued on our voyage, coasting the east shore of the island to the upper end; here we landed again, on an extended projecting point of clean sand and pebbles, where were to be seen pieces of coal sticking in the gravel and sand, together with other fragments of the fossil kingdom, brought down by inundations and lodged there. We observed a large kind of muscle in the sand; the shell of an oval form, having horns or protuberances near half an inch in length, and as thick as a crow-quill, which I suppose serve the purpose of grapnels to hold their ground against the current. Embarked again, doubled the point of the island, and arrived at Point Coupé in the evening."—*Travels, p.* 431.

---

* Since the above was written, I have a letter from Major Leconte, of New York, (June 13, 1836), in which he mentions having just received his specimens of this curious *Unio*, with some others which are very interesting, and he has kindly promised to place a specimen in my cabinet.

I have several times endeavoured to procure the shell mentioned by Bartram, but have not been fortunate enough to succeed. The specimen figured here belongs to Professor Shepard, to whom I am indebted for several other fine species from the same locality. Professor Shepard informs me that he received three individuals from his friend Mr Cowper, with the remark that they were obtained with difficulty during the last summer from a bar in the Altamaha. Two of these specimens were given to Professor Ravenel, to whose kindness I am indebted for the promise of one of them.

UNIO PLICIFERUS. Plate XVII. fig. 53.

Testâ ellipticâ, inæquilaterali, subinflatâ, posticè undulatâ; valvulis anticè crassioribus; natibus prominulis; epidermide atro-viridi; dentibus cardinalibus submagnis; lateralibus rectis; margaritâ purpureâ.

Shell elliptical, inequilateral, somewhat inflated, undulated behind; valves thicker before; beaks rather prominent; epidermis blackish green; cardinal teeth rather large; lateral teeth straight; nacre purple.

Hab. Mexico. Dr Burrough.
My Cabinet.
Cabinet of Dr Burrough.
Cabinet of Academy of Natural Sciences.

Diam. ·8, Length 1·2, Breadth 2·1 inches.

Shell elliptical, inequilateral, somewhat inflated, furnished with numerous small folds on the posterior slope and side; substance of the shell thick before, and thinner behind; beaks rather prominent; ligament short and light horn-coloured; epidermis very dark green; cardinal teeth rather large, single in the right valve and double in the left; lateral teeth rather short and straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices situated on the base of the cardinal teeth; cavity of the shell rather deep; cavity of the beak angular; nacre purple, rarely white.

Remarks.—Among the shells recently sent by Dr Burrough from Mexico, were many specimens of this species, which I believe not to have been before described. It is remarkable for the numerous small folds on the posterior slope, and these in some individuals extend over the umbonial slope and posterior half of the side. In the old specimens the posterior margin is disposed to be biangular, and the epidermis is quite black—in the younger it is dark green, and obscure rays may sometimes be observed. Among the specimens examined, two were white in the nacre, and one of these salmon-coloured within the beaks. The lateral teeth, where the beaks are eroded, are somewhat curved.

Unio Tappanianus. Plate XVII. fig. 55.

Testâ obovatâ, subinflatâ, inæquilaterali, posticè dilatatâ; valvulis tenuibus; natibus subprominentibus, undulatisque; epidermide fulvo-fuscâ; dentibus cardinalibus compressis curvisque; lateralibus tenuis; margaritâ subsalmoniâ.

Shell obovate, rather inflated, inequilateral, dilated behind; valves thin; beaks somewhat prominent and undulated; epidermis yellowish brown; cardinal teeth compressed and curved; lateral teeth thin; nacre somewhat salmon.

U. viridis (Conrad), not Rafinesque.

Hab. Juniata, near Hollidaysburg. Dr. Kirtland.
Schuylkill, and a small stream near Lancaster. Mr Hyde.

My Cabinet.
Cabinet of Dr Kirtland.
Cabinet of Judge Tappan.
Cabinet of Mr Hyde.

Diam. ·7, Length 1·1, Breadth 2 inches.

Shell obovate, rather inflated, inequilateral, dilated behind, subalate; umbonial slope rounded, inflated; substance of the shell thin and transparent behind, opaque and thicker before; beaks somewhat prominent, furnished with double undulations; ligament rather short and slender; epidermis yellowish brown, with dark rays, more numerous on the portion behind the umbonial slope; cardinal teeth lamellar, curved outward, single in the right and double in the left valve; lateral teeth acicular; single in both valves, and nearly straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed on the base of the cardinal teeth; cavity of the shell deep and rounded; cavity of the beak small and angular; nacre somewhat salmon coloured.

Remarks.—Dr Kirtland found this shell near Hollidaysburg, on the Juniata, where he obtained it last autumn; and to his kindness I owe the specimen in my cabinet. In outline it resembles *U. modioliformis* (nobis), but cannot be easily confounded with that shell, being less inflated, less obovate, and more carinate. In the teeth it differs also, and is peculiar. The specimens which have come under my notice have the lateral teeth single in both valves; in the left valve there is a slight disposition in one of the specimens to duplication. The nacre of the shell is very iridescent and satin-like, the border dark ochre brown: this causes the stages of growth to be distinct.

It is remarkable that, being an inhabitant of the Schuylkill, there should have been but a single specimen taken, that river having been almost daily searched by so many active zoologists.

I name it after my friend, Judge Tappan, of Ohio.

ANODONTA DECORA. Plate XX. fig. 63.

Testâ ellipticâ, inæquilaterali, valdè inflatâ; valvulis tenuibus; natibus prominulis, ad apices undulatis; epidermide glabrâ, unâ vittatâ; margaritâ albâ, salmonis colore tinctâ.

Shell elliptical, inequilateral, very much inflated; valves thin; beaks somewhat prominent and undulated at the tip; epidermis smooth and single banded; nacre white and salmon colour.

Hab. Canal near Cincinnati, Ohio. T. G. Lea.
Canal near Chilicothe, Ohio. Dr Ward.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Dr Ward.
Cabinet of Mr Hyde.

Diam. 1·8, Length 2·5, Breadth 3·9 inches.

Shell elliptical, nearly straight on the dorsal margin, subangular behind, inequilateral, very much inflated; substance of the shell thin; beaks rather prominent, and undulated in a double series at the tip; ligament rather long and straight; epidermis smooth and shining, furnished with green rays beyond the dark transverse band situated about the middle of the valve; posterior slope dark, with three rays on each valve; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices situated in the centre of the cavity of the beaks; cavity of the shell deep; cavity of the beaks rather small; nacre slightly salmon-coloured in the cavity, and white on the remaining portion.

Remarks.—My brother, T. G. Lea, called my attention some years ago to this shell. It, however, so nearly resembled *A. plana* (nobis), that I was disposed to consider it only a variety of that species. A remarkably fine suite, however, recently received from Dr Ward, has satisfied me that it ought to be separated from it. Indeed these specimens are so much inflated, as to have induced Dr Ward to suppose they might belong to *An. Stewartiana* (nobis). The broad and distinct band which in adults transversely crosses the valve about half way between the beak and the margin, is very remarkable in this species. This band defines the extent, in the interior, of the tint of salmon colour. Beyond this the epidermis is usually of a fine green and rayed, while the umbones and beaks are almost without rays.

BULIMUS LACTEUS. Plate XXIII. fig. 100.

Testâ ovato-conicâ, imperforatâ, nitidâ, lacteâ, tenui, subdiaphanâ, minutissimè transversim striatâ, infernè bruneo vittatâ; anfractibus senis; aperturâ subparvâ; labro acuto.

Shell ovately conical, imperforate, shining, milky, thin, somewhat transparent, transversely and minutely striate, base with a brown band; whorls six; aperture rather small; outer lip acute.

Hab. about one hundred miles up the Magdalena River, Colombia. T. R. Peale.

My Cabinet.
Philadelphia Museum.

Diam. ·4, Length ·7 of an inch.

Remarks.—This is one of the new shells brought by Mr Peale from his scientific expedition into Colombia. It may be distinguished by the brown band, which immediately surrounds the base of the columella. One of the individuals under my inspection is more transparent and less white than the other.

BULIMUS PEALIANUS. Plate XXIII. fig. 105.

Testâ ovato-conicâ, imperforatâ, lævi, nitidâ, cinereâ, subcrassâ; flammulis purpureis longitudinalibus pictâ; anfractibus senis; aperturâ patulâ, purpureâ; labro acuto, reflexo.

Shell ovately conical, imperforate, smooth, shining, ash coloured, rather thick; furnished with longitudinal purple spots; whorls six; aperture widened out, purple; outer lip acute, reflected.

Hab. near the Rapids of Angostura, Colombia. T. R. Peale.

Philadelphia Museum.

Diam. ·4, Length 1·1 inches.

Remarks.—During Mr Peale's travels in Colombia, he found a single specimen of this beautiful species, and I am indebted to his kindness for the privilege of describing it. In this individual the longitunal spots are more numerous on the whorl next to the body-whorl, there being none on that part near to the outer lip.

BULIMUS COLOMBIANUS. Plate XXIII. fig. 110.

Testâ elongato-turritâ, perforatâ, nitidâ, albâ, tenui, minutissimè transversim striatâ ; apice aureâ; anfractibus septenis ; aperturâ subparvâ ; labro acuto.

Shell elongately turrited, perforate, shining, white, thin, transversely and minutely striate ; apex golden colour ; whorls seven ; aperture rather small ; outer lip acute.

Hab. about one hundred miles up the Magdalena River, Colombia. T. R. Peale.

Philadelphia Museum.

Diam. ·5, Length 1·2 inches.

Remarks.—The spire is long, and the aperture about one-third the length of the shell. It is nearly milk white, and so thin as to be somewhat translucent.

BULIMUS CORNEUS. Plate XXIII. fig. 111.

Testâ ovato-conicâ, umbilicatâ, corneâ, tenui, pellucidâ; anfractibus septenis; aperturâ parvâ ; labro acuto.

Shell ovately conical, umbilicate, horn-colour, thin, pellucid ; whorls seven ; aperture small ; outer lip acute.

Hab. Buenavista, Colombia. T. R. Peale.

My Cabinet.
Philadelphia Museum.
Diam. ·3, Length ·7 of an inch.

Remarks.—In form and size this resembles the *B. lactea*, herein described, but may be distinguished at once by its colour, its umbilicus, and the absence of a band. Owing, apparently, to the roughness of the epidermis, its surface is scarcely shining. I owe this shell to the kindness of Mr Peale.

HELIX WARDIANA. Plate XXIII. fig. 82.

Testâ orbiculato-convexâ, umbilicatâ, infernè depressâ, nitidâ, corneâ, diaphanâ; anfractibus senis, longitudinaliter striatis; striis confertis; spirâ obtusâ; labro acuto, intus spissatâ.

Shell orbicularly convex, umbilicate, flattened below, shining, horn-coloured, translucent; whorls six, longitudinally striate; striæ close; spire obtuse; outer lip acute, within thickened.

Hab. near Cincinnati, Ohio. T. G. Lea.
near Chilicothe, Ohio. C. J. Ward, M.D.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of C. J. Ward, M.D.
Diam. ·4, Length ·3 of an inch.

Remarks.—While I had several specimens of this species from my brother, T. G. Lea, holding them somewhat in doubt as to their being distinct from *H. ligera* (Say), I received several fine specimens from Dr Ward, who informed me that "the inhabitant is differently marked from *ligera*." He says, "the base of the foot is *white*, posteriorly acute. Body white, with blackish brown spots over it, and one *large* and two smaller black longitudinal bands extending from the neck to the end of the body."

CYCLOSTOMA MACULATA. Plate XXIII. fig. 87.

Testâ suborbiculatâ, transversim striatâ, carinatâ, maculatâ, diaphanâ, umbilicatâ; anfractibus quinis; spirâ subbrevi; ultimo anfractu medio carino cincto; labro margine albo, reflexo.

Shell suborbicular, transversely striate, carinate, spotted, transparent, umbilicate; whorls five; spire rather short; carinate on the middle of the last whorl; margin of the lip white and reflected.

Hab. Manilla. W. W. Wood.
Philadelphia Museum.
Diam. ·4, Length ·5 of an inch.

Remarks.—This pretty little species of *Cyclostoma* was sent by Mr Wood to Mr T. R. Peale, to whom I owe the opportunity of describing it. Its transparency and numerous brown spots distinguish it at once from all other species with which I am acquainted. In the individual before me, there is a second obscure carination above that on the middle of the whorl. In others this may be found to be more distinct or entirely wanting.

PLANORBIS LENS. Plate XXIII. fig. 83.

Testâ parvâ, lenticulari, lato-umbilicatâ, ad periphæriam carinatâ, pellucidâ, corneâ; anfractibus ternis; aperturâ magnâ.

Shell small, lenticular, widely umbilicate, carinate on the periphery, pellucid, horn-coloured; whorls three; aperture large.

Hab. near Cincinnati, Ohio. R. Buchanan.
My Cabinet.
Cabinet of R. Buchanan.
Cabinet of T. G. Lea.
Diam. 3-20ths, Length 1-20th of an inch.

Remarks.—This is the smallest of the *Planorbes* which has come under my notice, and may at once be distinguished by its lenticular form. The specimens in my possession I owe to my brother, T. G. Lea. They were first pointed out to him by Mr Buchanan.

NOTE.—I would be glad to be permitted to mention here, that the *Helicina pulcherrima* (Vol. I. page 161), and *Helix purpuragula* (Vol. I. page 163), supposed to be from Java, really inhabit Cuba, having recently received some collected on the mountainous part of that island.

Recently, in examining with a lens a very perfect specimen of *Carocolla spinosa* (See Vol. I. page 114), I observed a remarkable character which had before escaped me. The superior part, in very perfect specimens, exhibits a crimped epidermis of a peculiar nature, being very irregular in the sizes of the crimps. Beneath the epidermis the shell is striate.

Continuation of Mr Lea's Paper. Read, August 19th, 1836.

GENUS MARGARITA.

SUBGENUS UNIO.

UNIO GRANIFERUS. Plate XIX. fig. 60.

Testâ nodulosâ, subrotundâ, inflatâ, ponderosâ; valvulis crassibus; natibus valdè prominentibus; epidermide atro-fuscâ; dentibus cardinalibus grandibus; lateralibus brevibus subrectisque; margaritâ colore cocao.

Shell nodulous, subrotund, inflated, ponderous; valves thick; beaks very prominent; epidermis dark brown; cardinal teeth large; lateral teeth short and nearly straight; nacre chocolate-colour.

Hab. Ohio River, near Cincinnati. T. G. Lea.
My Cabinet.
Cabinet of T. G. Lea.
Cabinet of Mr Hyde.

Diam. 1·4, Length 1·9, Breadth 1·9 inches.

Shell nodulous, subrotund, emarginate behind, inflated, ponderous, sulcate on the posterior slope; substance of the shell very thick; umbones large; beaks very prominent; tubercles not numerous, rather small, disposed to be erect and transverse; ligament rather short; epidermis dark brown; cardinal teeth large and spread out; lateral teeth short, thick, and nearly straight; anterior cicatrices distinct; posterior cicatrices distinct; dorsal cicatrices situated on the inferior portion of the cardinal teeth; cavity of the shell small; cavity of the beaks deep and angular; nacre chocolate-colour.

Remarks.—This shell is very closely allied to the *verrucosus* (Barnes), and has been, I believe, generally considered as a variety of it. In several of its characters, however, it is quite distinct. It differs in being a smaller shell, in being much more inflated over the umbones, in the granules or tubercles being smaller, more erect and more transverse. In the epidermis it is much darker. In my youngest specimen the beaks are nearly perfect, and at the tip they are very minutely and closely undulated.

UNIO SPLENDIDUS. Plate XIX. fig. 61.

Testâ ellipticâ, valdè inflatâ; valvulis subcrassibus; natibus prominentibus; epidermide valdè radiatâ; dentibus cardinalibus subcompressis; lateralibus remotis lamellatisque; margaritâ splendidâ rosâque.

Shell elliptical, very much inflated; valves rather thick; beaks prominent; epidermis very much rayed; cardinal teeth somewhat compressed; lateral teeth separate and lamellar; nacre splendid rose-colour.

Hab. Altamaha River, near Darien, Geo. James Hamilton Cowper, Esq.

Hab. Altamaha, Liberty County, Geo. Lewis Leconte, Esq.

My Cabinet.
Cabinet of Professor Shepard.
Cabinet of Major Leconte.

Diam. 1·4, Length 1·7, Breadth 2·8 inches.

Shell elliptical, very much inflated; substance of the shell rather thick; umbones large; umbonial slope carinate; posterior slope with three indistinct ribs on each valve; beaks prominent; ligament rather long and somewhat thick; epidermis yellowish, with numerous dark green rays over the whole disk; cardinal teeth somewhat compressed, double in both valves, enlarged at the anterior portion; lateral teeth separated from the cardinal teeth, lamellar, the inferior division of that of the left valve enlarged, and longer than the superior one; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices within the cavity of the beaks under the cardinal tooth; cavity of the shell deep and angular along the carina of the umbonial slope; cavity of beaks deep and rounded; nacre splendid rose-colour.

Remarks.—I owe this species, which came into my possession some months since, to Professor Shepard, who procured it from his friend Mr Cowper. It very closely resembles the *U. ochraceus* (Say), but may be distinguished from it by its carinate umbonial slope, and its being more inflated. The colour of all the specimens I have examined is, in the nacre, of a rose tint. A single one has a slight salmon colour mixed with it. When more are examined, there may be some found entirely salmon or white.

I owe to the kindness of Major Leconte some very fine specimens from Liberty county, where they were found with the *U. spinosus*.

SUBGENUS MARGARITANA.

M. ARCULA. Plate XXII. fig. 69.

Testâ plicatâ, triangulari, valdè inflatâ; valvulis tenuissimis; clivo umboniali carinato; natibus valdè prominentibus; epidermide atro-viride, radiatâ; dentibus laminatis, irregularibus; margaritâ cœruleâ.

Shell plicate, triangular, very much inflated; valves very thin; umbonial slope carinate; beaks very prominent; epidermis dark green, radiated; teeth lamellar, irregular; nacre bluish.

Hab. Altamaha, Liberty County, Geo. Lewis Leconte, Esq.
My Cabinet.
Cabinet of Major Leconte.

Diam. 1·6, Length 1·7, Breadth 2·2 inches.

Shell plicate, triangular, very much inflated; substance of the shell very thin; umbones very large; umbonial slope acutely carinate; posterior slope very much flattened, having an indistinct furrow along the edge of the carina; folds about eight, large on the beaks, and diminishing along the edge of the carina; ligament small; epidermis dark green, with numerous green rays over the whole disk; teeth lamellar, irregular; anterior cicatrices confluent; posterior cicatrices not perceptible; dorsal cicatrices not perceptible; cavity of the shell very deep, acutely angular under the carina, having two furrows leading from the beak to the posterior margin; cavity of the beak very deep and angular; nacre very thin, bluish, often tinted with pink.

Remarks.—I owe to the kindness of Major Leconte the possession of this very interesting species. It is entirely distinct from any I am acquainted with, and is peculiar for the folds which are placed along the umbonial slope, and lie at right angles with it. It is among the most inflated species of the family, and the substance of the shell is thinner than in any species of its size which I know. The posterior slope is so flat, that the valves when placed on that part will rest there. In the folds it has some resemblance to the *Alas. undulata* (Say), but in this species they are larger and more numerous than in the *undulata.* In outline it resembles *U. triangularis* (Barnes). Taking a posterior view of it, one is reminded, by the outline, of *Cardium cardissa.*

Continuation of Mr Lea's Paper. Read, Nov. 4th, 1836.

UNIO DORFEUILLIANUS. Plate XVII. fig. 54.

Testâ subtriangulari, inflatâ, tuberculatâ, inæquilaterali; valvulis præcrassis; natibus magnis elevatisque; dentibus cardinalibus magnis erectisque; lateralibus brevibus curvisque; margaritâ albâ.

Shell subtriangular, inflated, tuberculate, inequilateral; valves very thick; beaks large and elevated; cardinal teeth large and erect; lateral teeth short and curved; nacre white.

Hab. Ohio River. Mr Dorfeuille, Cincinnati.
My Cabinet.

Diam. 2·2, Length 2·6, Breadth 2·9 inches.

Shell subtriangular, inflated, tuberculate on the umbones; substance of the shell very thick; beaks large, very prominent and recurved; ligament short and thick; epidermis dark brown and transversely striate; cardinal teeth large and erect; lateral teeth short, thick and curved; anterior cicatrices distinct, the great one forming a very deep pit; posterior cicatrices distinct; dorsal cicatrices situated on the inferior part of the cardinal tooth; cavity of the shell deep; cavity of the beaks deep and angular; nacre white.

Remarks.—A single specimen of this species belonged to the Museum of Mr Dorfeuille, who very obligingly presented it to me. I do not know from what part of the Ohio it was obtained, and although a single specimen, and resembling two species, I have considered it proper to propose it as a new species, being unable to class it with any one known to me. In general outline and thickness it resembles *U. trigonus* (nobis), but, having higher beaks and being tuberculated, cannot be classed with that species. In the possession of tubercles it resembles *U. pustulatus* (nobis), but differs from it in having very elevated thick beaks, in having very few tubercles (these are scattered over the central portion of the disk only), and in the outline being subangular.

UNIO DISCUS. Plate XVIII. fig. 57.

Testâ ellipticâ, valdè compressâ, inæquilaterali; valvulis crassis; natibus prominentibus; dentibus cardinalibus magnis; lateralibus longis, à cardinalibus separatis; margaritâ purpureâ et iridescente.

Shell elliptical, very much compressed, inequilateral; valves thick; beaks prominent; cardinal teeth large; lateral teeth long, being separated from the cardinal teeth; nacre purple and iridescent.

Hab. India.

My Cabinet.

Diam. 1·4, Length 3·3, Breadth 5·2 inches.

Shell elliptical, very much compressed, biangular behind, inequilateral; substance of the shell thick; beaks prominent; ligament long and thick; cardinal teeth large, regularly sulcate and deeply cleft in the left valve; lateral teeth long, thicker at the posterior end, and separated from the cardinal tooth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed across the base of the cardinal tooth; cavity of the shell very shallow; cavity of the beaks rather small and subangular; nacre purple and iridescent.

Remarks.—This description is made from a single decorticated valve, procured of Mr B. Tanner, who purchased it in a lot of shells brought from India. When I first saw this specimen it was evident to me that it differed from any known American species; and finding, subsequently, that it was most probably a native of India, I could no longer hesitate as to its being new. It bears some resemblance to *U. crassidens* (Lam.) and *U. alatus* (Say). It differs from the former in being flatter, more spread out, and the substance of the shell being less thick. From the latter it differs in being thicker in the substance of the shell, in being ovate, and being without a wing. It is very much to be regretted that the exterior should be so much deprived of its epidermis as to render it impossible to form a correct opinion as to its appearance in a perfect state.

UNIO CONTRADENS. Plate XVIII. fig. 58.

Testâ obovatâ, subinflatâ, inæquilaterali; valvulis tenuibus; natibus subprominentibus undulatisque; epidermide subviridi; dentibus cardinalibus lineatis, duplicibus in valvulam dextram; lateralibus tenuibus subcurvisque; margaritâ albâ et iridescente.

Shell obovate, rather inflated, inequilateral; valves thin; beaks rather prominent and undulated; epidermis greenish; cardinal teeth linear, the double one in the right valve; lateral teeth thin and somewhat curved; nacre pearly white and iridescent.

Hab. . . . .

My Cabinet.

Diam. ·7, Length 1·1, Breadth 1·9 inches.

Shell obovate, rather inflated, smooth, inequilateral; substance of the shell thin; beaks somewhat prominent, with numerous small undulations extending on the posterior slope; ligament rather long and thin; epidermis yellowish green over the whole disk, except the posterior slope, which is green; cardinal teeth long, linear, *single in the left and double in the right valve;* lateral teeth long, thin, and somewhat curved; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks rather shallow and angular; nacre pearly white and iridescent.

Remarks.—I am not acquainted with the habitat of this shell, having purchased it of a dealer, who did not know from what waters it was obtained. In the exterior and general appearance it resembles *U. Tappanianus* (nobis). The remarkable character of its cardinal teeth will distinguish it from that and all other species with which I am acquainted. The single and double tooth have here changed places, the single being in the left valve. They are thin, and run nearly parallel to the margin. The undulations about the region of the beaks are remarkably fine and beautiful.

Unio Menkianus. Plate XIX. fig. 59.

Testâ ellipticâ, subcompressâ, inæquilaterali, valvulis subtenuibus; natibus subprominentibus undulatisque; epidermide fulvâ et multiradiatâ; dentibus cardinalibus parvis erectisque; lateralibus longis subrectisque; margaritâ albâ et iridescente.

Shell elliptical, rather compressed, inequilateral; valves rather thin; beaks somewhat prominent and undulated; epidermis yellow and much rayed; cardinal teeth small and erect; lateral teeth long and nearly straight; nacre pearly white and iridescent.

Hab. Harpeth River, Ten. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.

Diam. ·9, Length 1·5, Breadth 2·5 inches.

Shell elliptical, rather compressed, inequilateral, radiated over the whole disk; substance of the shell thin behind, thicker before; beaks somewhat prominent and undulated at tip; ligament rather long and thin; epidermis yellow, rather smooth, with numerous rather large, green rays, radiating to all parts of the margin; cardinal teeth small, conical, deeply cleft in the left valve; lateral teeth long and nearly straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather shallow; cavity of the beaks rather small and subangular; nacre pearly white and iridescent.

Remarks.—This is another new species of the many I owe to the kindness of Professor Troost. It has some resemblance to *U. interruptus* (nobis), and may be said to connect that shell with *U. crassus* (Say). The two specimens which I have before me are covered with beautiful green rays over the whole disk, they being thicker and darker on the posterior half. The undulations of the beaks are small and numerous. I name it after the able German conchologist, Dr Menke.

ANODONTA NUTTALLIANA. Plate XX. fig. 62.

Testâ alatâ, ellipticâ, compressâ, glabrâ, inæquilaterali; valvulis tenuibus connatisque; natibus compressis, ad apices undulatis; epidermide politâ; margaritâ albâ.

Shell winged, elliptical, compressed, smooth, inequilateral; valves thin and connate; beaks compressed and undulated at the tip; epidermis polished; nacre white.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.

Diam. ·7, Length 1·5, Breadth 2·3 inches.

Shell winged, elliptical, flattened on the side and enlarged on the umbonial slope, subemarginate at base, smooth, inequilateral; substance of the shell thin, the valves being connate over the ligament; beaks compressed and undulated at the tip; umbonial slope furnished with several impressed lines; epidermis smooth and polished, having a dark broad band at the line of growth near the margin; cicatrices scarcely visible; cavity of the shell very small; cavity of the beaks very small; nacre white.

Remarks.—I am greatly indebted to the learned and enterprising traveller, Professor Nuttall, for this and two other species of *Anodonta*, which come from an entirely new locality. The rivers beyond the Rocky Mountains had not before been examined in regard to their mollusca, and we have now for the first time the pleasure of seeing a specimen of this family from these waters. The Wahlamat is the river known in Lewis and Clark's Travels under the name of Multnoma.

This species has some resemblance to *An. Benedictensis* (nobis), but may be distinguished by its flattened sides and dark band, as well as its polished surface.

ANODONTA WAHLAMATENSIS. Plate XX. fig. 64.

Testâ alatâ, triangulari, subinflatâ, inæquilaterali; valvulis tenuibus connatisque; natibus subcompressis, ad apices undulatis; epidermide subfulgidâ; margaritâ albâ.

Shell winged, triangular, somewhat inflated, inequilateral; valves thin and connate; beaks rather compressed and undulated at the tip; epidermis somewhat shining; nacre white.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.

Diam. ·8, Length 1·8, Breadth 2·5 inches.

Shell winged, triangular, inflated on the lower posterior part, inequilateral; substance of the shell thin, the valves being connate over the ligament; beaks rather compressed, undulated at the tip, and yellow as far as the first stage of growth; epidermis rather smooth and shining, having a small dark band at the line of growth near the margin; cicatrices scarcely visible; cavity of the shell shallow; cavity of the beaks very shallow; nacre white.

Remarks.—This is one of the species brought by Professor Nuttall from his late expedition to the Columbia River, over the Rocky Mountains. It has some resemblance to the *Nuttalliana*, but cannot be easily mistaken for that species, being different in outline and more inflated. In its outline and in the inflation of the lower posterior portion of the shell, it resembles *Alas. complanata* (Barnes). Professor Nuttall also met with this and the above species in Lewis's River, a branch of the Shoshonee.

ANODONTA PAVONIA. Plate XXI. fig. 65.

Testâ ellipticâ, inflatâ, valdè radiatâ, inæquilaterali; valvulis tenuibus; natibus prominulis, ad apices undulatis; epidermide glabrâ; margaritâ cæruleâ.

Shell elliptical, inflated, very much radiated, inequilateral; valves thin; beaks somewhat prominent and undulated at the tip; epidermis smooth; nacre bluish.

Hab. head waters of the Little Beaver, Ohio. J. P. Kirtland, M. D.
My Cabinet.
Cabinet of Dr Kirtland.
Cabinet of Mr Hyde.
Cabinet of Dr Jay.

Diam. 1·1, Length 1·5, Breadth 3 inches.

Shell elliptical, inflated, very much radiated, inequilateral; substance of the shell thin; beaks somewhat prominent and furnished with rather large undulations at the tip; ligament rather short and thin; epidermis smooth, shining and furnished with numerous dark green rays, which diverge to the whole margin, the larger ones being generally about the centre of the valve; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices placed on the interior of the curve at the point of the beaks; cavity of the shell deep and large; cavity of the beak small and angular; nacre bluish.

Remarks.—I owe to Dr Kirtland this beautiful *Anodonta*, which he has recently discovered in the Little Beaver, in considerable quantities. In the interior it very much resembles *An. Ferussaciana* (nobis) and has, like that shell, an incipient tooth at the immediate point of the beak. In the exterior it is distinguished from all the species with which I am acquainted, by its numerous and very beautiful dark green rays, which so much pervade as to give the disk, in some individuals, almost a black appearance.

ANODONTA NEWTONIENSIS. Plate XXI. fig. 66.

Testâ ellipticâ, inflatâ, inæquilaterali; valvulis crassis; natibus subprominentibus, ad apices undulatis; epidermide fulgidâ; margaritâ albâ.

Shell elliptical, inflated, inequilateral; valves thick; beaks rather prominent and undulated at the tip; epidermis shining; nacre white.

Hab. Newtown Creek, New Jersey, near Philadelphia. Wm. Hyde.
Also Schuylkill, at Fair Mount.
My Cabinet.
Cabinet of Mr Hyde.

Diam. 2·1, Length 2·3, Breadth 4·6 inches.

Shell elliptical, inflated, inequilateral; substance of the shell thick; beaks somewhat prominent and rather largely undulated at the tip; ligament rather short; epidermis dark brown, smooth, shining and apparently without rays; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices obsolete; cavity of the shell deep; cavity of the beaks very small; nacre white, sometimes salmon colour.

Remarks.—The large specimen here figured was found by Mr Hyde in Newtown Creek, nearly opposite to Philadelphia, many years since, and is the only full grown or large one I have seen. Within five or six years, from time to time, I have found near Fair Mount, six individuals, which, although they appeared not to be mature shells, were evidently different from any described *Anodonta*, and I have not hesitated to refer them to this species observed by Mr Hyde. The specimens from Fair Mount are rather thin in the substance of the shell, while that from Newtown Creek is somewhat thick. This may be referred to difference of age. In all the specimens there is an entire absence of rays and the young are possessed of a yellow epidermis. This species differs from the *An. fluviatilis*, (*cataracta*, Say), in being more transverse, in the beaks being more medial and in having the undulations of the beaks larger, while the *fluviatilis* is more granulate.

ANODONTA OREGONENSIS. Plate XXI. fig 67.

Testâ subalatâ, ellipticâ, subinflatâ, inæquilaterali; valvulis tenuibus; natibus vix prominentibus, ad apices undulatis; epidermide subfulgidâ striatâque; margaritâ albâ.

Shell subalate, elliptical, somewhat inflated, inequilateral; valves thin; beaks scarcely prominent, undulated at the tip; epidermis rather shining and striate; nacre white.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.

Diam. 1, Length 1·8, Breadth 3·2 inches.

Shell somewhat winged, elliptical, rather inflated, inequilateral; substance of the shell thin; beaks scarcely prominent and undulate at tip; epidermis somewhat shining and striate; posterior and anterior cicatrices both confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beak very small; nacre white.

Remarks.—Another species for which I am indebted to Professor Nuttall, procured in his late journey. It has some resemblance to *An. cygnea*, but is still more closely allied to *An. Benedictensis* (nobis).

ANODONTA EXILIS. Plate XXII. fig. 68.

Testâ latâ, valdè compressâ, inœquilaterali; valvulis tenuibus; natibus vix prominulis; epidermide glabrâ; margaritâ ceruleâ et iridescente.

Shell wide, very much compressed, inequilateral; valves very thin; beaks scarcely prominent; epidermis smooth; nacre bluish and iridescent.

Hab. . . . . .

My Cabinet.

Diam. ·8, Length 1·6, Breadth 3·4 inches.

Shell wide, very much compressed, slender, rounded before and angular behind, inequilateral; dorsal and basal margin nearly parallel; substance of the shell very thin; beaks scarcely prominent; ligament long and thin; epidermis smooth, brown, apparently without rays; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices posterior to and below the cavity of the beaks; cavity of the shell wide and shallow; cavity of the beaks very small; nacre bluish and iridescent.

Remarks.—I procured this remarkably compressed *Anodonta* from Mr Warren, of Boston. Its habitat, unfortunately, was not known. It may be distinguished from all the other species with which I am acquainted by its compressed and slender form.

IRIDINA CŒLESTIS. Plate XXII. fig. 70.

Testâ latissimâ, subcylindraceâ, lævissimâ, valdè inæquilaterali; valvulis tenuibus; natibus prominulis; epidermide politâ, tenebrosâ; margaritâ cæruleâ et iridescente.

Shell very broad, subcylindrical, very smooth, very inequilateral; valves thin; beaks somewhat prominent; epidermis polished, very dark; nacre bluish and iridescent.

Hab. Africa.

My Cabinet.
Cabinet of Dr Jay.

Diam. ·7, Length 1·1, Breadth 3·4 inches.

Shell very broad, subcylindrical, very smooth, very inequilateral, straight on the dorsal margin, rounded before and angular behind; substance of the shell thin and delicate; beaks somewhat prominent, and apparently without undulations at the tip; epidermis highly polished, nearly black on the anterior, posterior and inferior portion of the valves, obsoletely rayed; cicatrices scarcely visible; cavity of the shell rather deep; cavity of the beaks very small; nacre bluish, with a tint of purple on the anterior portion, very iridescent.

Remarks.—The first specimen of this shell which came under my notice I purchased from a dealer in New York, who informed me it came from Africa. For a second specimen, I am indebted to Dr Jay, who gave me the same habitat. It was sent to him under the impression of its being the "*Mutel*" of Adanson. By a comparison with Adanson's figure, it will be at once observed to differ from it entirely in outline. It cannot easily be confounded with any of the described species of *Iridina.* It is a small species, and may be distinguished at once by its dark ebony epidermis, and beautiful blue and iridescent nacre. In none of the specimens which I have seen, is there the least disposition to crenulation on the dorsal margin. On the carina there is a small line below, and nearly parallel to the dorsal margin.

BULIMUS GLANDIFORMIS. Plate XXIII. fig. 92.

Testâ ovatâ, rugosâ, subinflatâ, imperforatâ, subcrassâ, granosâ, rufo-fuscâ, albo-maculatâ ; anfractibus quaternis, ultimo magno ; aperturâ purpureâ, ovatâ, submagnâ ; labro reflexo ; columellâ lævi.

Shell ovate, rugose, somewhat inflated, imperforate, rather thick, granose, reddish brown, white spotted ; whorls four, the last being large ; aperture purple, ovate, rather large ; outer lip reflexed ; columella smooth.

Hab. New Granada, between La Plata and Tocaima. J. H. Gibbon, M. D.

My Cabinet.

Diam. ·7, Length 1·3 inches.

Remarks.—This species is about the size of and somewhat resembles an acorn. Its rugosity is owing to the surface being covered with numerous small pits. The spots are few, and placed nearly at the termination of the last whorl. On the same whorl, further removed from the tip, there are numerous indistinct white marks. The body-whorl is about five-sixths the length of the shell, the superior whorls being lighter, and having a dark indistinct line along the suture. The apex is obtuse, and the reflected lip white and rounded like a cord. I am indebted to Dr Gibbon for this species, obtained during his recent travels in New Granada.

BULIMUS PARVUS. Plate XXIII. fig. 96.

Testâ conicâ, imperforatâ, carinatâ, lacteâ ; apice rufo ; anfractibus senis, planulatis ; aperturâ ovatâ ; labro acuto ; columellâ lævi, subangulatâ.

Shell conical, imperforate, carinate, milky white ; apex reddish ; whorls six, flattened ; aperture ovate ; outer lip acute ; columella smooth, subangular.

Hab. near Carthagena, S. A. J. H. Gibbon, M. D.
My Cabinet.
Diam. ·3, Length ·5 of an inch.

Remarks.—A very small species, of which I received from Dr Gibbon only a single specimen. There are some marks on it which induce me to believe that it may sometimes be found banded.

BULIMUS VIRGO. Plate XXIII. fig. 97.

Testâ conico-acutâ, perforatâ, nitidâ, diaphanâ, longitudinaliter striatâ ; anfractibus septenis, convexiusculis ; aperturâ ovatâ ; labro acuto ; columellâ angulatâ.

Shell acutely conical, perforate, shining, longitudinally striate, diaphanous ; whorls seven, slightly convex ; aperture ovate ; outer lip acute ; columella angular.

Hab. near Carthagena, S. A. J. H. Gibbon, M. D.
My Cabinet.
Diam. ·3, Length ·9 of an inch.

Remarks.—A single specimen only of this was brought by Dr Gibbon. It resembles in size, and some of its characters, the *maculatus* herein described. It may, however, be at once distinguished by its want of spots, the absence of a black apex, and in being perforate.

BULIMUS GIBBONIUS. Plate XXIII. fig. 99.

Testâ ovatâ, ventricosâ, perforatâ, subcrassâ, granosâ, tenebroso-fuscâ, atro-maculatâ; anfractibus quinis, ultimo magno; aperturâ purpureâ, magnâ, obliquâ; labro reflexo; columellâ albidâ.

Shell ovate, ventricose, perforate, somewhat thick, granose, dark brown, black maculate; whorls five, the last being large; aperture purple, large, oblique; outer lip reflexed; columella whitish.

Hab. New Granada, between La Plata and Tocaima. J. H. Gibbon, M. D.

My Cabinet.

Diam. 2·4, Length 3·5 inches.

Remarks.—I owe the possession of this fine shell to the kindness of Dr Gibbon, who obtained it during his expedition to the Pacific Ocean, by Panama; and to him I dedicate it. It is remarkable for its dark colour, the substance of the shell being of a dark purple. The spots are dark, small, irregular and indistinct, and the surface irregularly pitted and minutely granulate. The body-whorl is about five-sixths the length of the shell, the superior whorls being darker, and having a white indistinct line along the suture. The apex is pointed.

BULIMUS GRACILIS. Plate XXIII. fig. 102.

Testâ subfusiformâ, nitidâ, subperforatâ, albidâ, trivittatâ, longitudinaliter striatâ; anfractibus planulatis; aperturâ ovatâ; labro reflexo; columellâ lævi, purpureâ.

Shell subfusiform, shining, subperforate, whitish, with three imperfect bands, longitudinally striate; whorls flattened; aperture ovate; outer lip reflexed; columella smooth and purple.

Hab. near Carthagena, S. A. J. H. Gibbon, M. D.

My Cabinet.

Diam. ·6, Length 1·4 inches.

Remarks.—Among the fine land shells which I owe to Dr Gibbon was a single specimen of this graceful looking species. Other individuals may be more or less coloured. In this one the bands are indistinct, and are of a brownish tint, being more strongly marked in the interior.

Bulimus decoratus. Plate XXIII. fig. 108.

Testâ subturritâ, imperforatâ, nitidâ, croceâ, trifasciatâ; anfractibus senis, convexiusculis; aperturâ ovatâ, caniculatâ; labro subreflexo; columellâ arcuatâ.

Shell somewhat turrited, imperforate, shining, reddish saffron, three-banded; whorls six, somewhat convex; aperture ovate, channeled; outer lip slightly reflexed; columella arched.

Hab. near Carthagena, S. A. J. H. Gibbon, M. D.
My Cabinet.
Diam. ·5, Length 1·2 inches.

Remarks.—A singularly beautiful species, and remarkable for its fine colour, its three yellow bands, and the channel at the base. It is among the finest of the species brought by Dr Gibbon from his late voyage to New Granada.

Bulimus maculatus. Plate XXIII. fig. 112.

Testâ conico-acutâ, imperforatâ, nitidâ, albâ, rufo-maculatâ; apice nigro; anfractibus septenis, subplanulatis; aperturâ ovatâ; labro acuto; columellâ subangulatâ.

Shell acutely conical, imperforate, shining, white, with reddish spots; apex black; whorls seven, rather flattened; aperture ovate; outer lip sharp; columella somewhat angular.

Hab. near Carthagena, S. A. J. H. Gibbon, M.D.
My Cabinet.

Diam. ·3, Length ·9 of an inch.

Remarks.—A delicate little species, of which I received but a single specimen, and this not entirely perfect in the mouth. The spots are quadrate, and arranged in a double series on the four lower whorls.

HELIX MITCHELLIANA. Plate XXIII. fig. 71.

Testâ supernè obtuso-conicâ, infernè inflatâ, longitudinaliter et subtiliter striatâ, corneâ, diaphanâ, imperforatâ; anfractibus quinis; aperturâ subrotundatâ; labro reflexo; columellâ lævi.

Shell above obtusely conical, below inflated, longitudinally and finely striate; horn-colour, transparent, imperforate; whorls five; aperture nearly round; outer lip reflexed; columella smooth.

Hab. Ohio. J. K. Mitchell, M. D.
My Cabinet.

Diam. ·7, Length ·4 of an inch.

Remarks.—I am indebted to Dr Mitchell for this shell, which was sent to him by a friend from Ohio. It is rather larger than the *H. clausa* (Say) and *H. jejuna* (Say), but in form resembles them. It may be distinguished from the latter in not being perforate, and from the former in having a sharper lip. In its striæ it is distinct from both, in having them larger and much better defined.

HELIX VANCOUVERENSIS. Plate XXIII. fig. 72.

Testâ plano-convexâ, infernè planulatâ, nitidâ, longitudinaliter striatâ, corneâ, latè umbilicatâ; anfractibus quinis, rotundatis; aperturâ subrotundatâ; labro infernè subreflexo, supernè depresso; columellâ brevi, callosâ.

Shell plano-convex, below flattened, shining, longitudinally striate, horn-colour, widely umbilicate; whorls five, rounded; aperture roundish; outer lip below somewhat reflexed, above depressed; columella short, callous.

Hab. Fort Vancouver, Oregon. Professor Nuttall.
My Cabinet.
Cabinet of Professor Nuttall.
Diam. 1·1, Length ·5 inches.

Remarks.—Professor Nuttall informs me that this species is common to the shores of the Columbia River. Young individuals very closely resemble *H. concava* (Say). In the older specimens the lip will at once distinguish it. The depression of the superior part of the outer lip is a remarkable character. In the older specimens the inferior and superior termination of the outer lip are joined by a remarkable callus.

HELIX NUTTALLIANA. Plate XXIII. fig. 74.

Testâ obtuso-conicâ, subtus planulatâ, umbilicatâ, longitudinaliter minutè striatâ, supernè luteâ, infernè tenebroso-fuscâ, propè carinam fasciatâ; anfractibus septenis; aperturâ subrotundatâ, intus fasciatâ; labro subreflexo; columellâ lœvi.

Shell obtusely conical, beneath flattened, umbilicate, longitudinally and minutely striate, above yellowish, below dark brown, near the carina banded; whorls seven; aperture nearly round, banded within; lip somewhat reflexed; columella smooth.

Hab. from Fort Vancouver down to the ocean, Oregon. Professor Nuttall.
My Cabinet.
Cabinet of Professor Nuttall.
Diam. 1.3, Length ·8 inches.

Remarks.—This may be considered to be the finest *Helix* found within the territory of the United States. It has little resemblance to any of our species yet known. It most resembles the *H. solilaria*, but is rather larger than that species. I owe to the kindness of Professor Nuttall two specimens—one is darker on the superior part than the other, being brownish. The dark band about the middle of the whorl is remarkable—above it are two indistinct bands.

HELIX COLUMBIANA. Plate XXIII. fig. 75.

Testâ obtuso-convexâ, infernè subrotundatâ, nitidâ, longitudinaliter striatâ, corneâ, diaphanâ, umbilicatâ; anfractibus senis, subrotundatis; aperturâ subrotundatâ; labro albo et reflexo, infernè subcalloso; columellâ lævi.

Shell obtusely convex, rounded below, shining, longitudinally striate, horn-coloured, transparent, umbilicate; whorls six, roundish; aperture rather round; outer lip white and reflexed, slightly callous below; columella smooth.

Hab. Fort Vancouver, Oregon. Professor Nuttall.
My Cabinet.
Cabinet of Professor Nuttall.
Diam. ·7, Length ·4 of an inch.

Remarks.—One of the new shells brought by Professor Nuttall from his late expedition. It very closely resembles a small individual of *H. thyroideus* (Say), but may be distinguished by its having the striæ more distant, and in having a more depressed spire.

HELIX MAGNIFICA. Plate XXIII. fig. 88.

Testâ obtuso-conicâ, subcarinatâ, longitudinaliter striatâ, fasciis flammeis, rubris albisque pictâ, subtus seriebus pluribus punctorum rufescentium ornatâ, latè umbilicatâ; anfractibus quinis, supernè planulatis, infernè subconvexis; aperturâ transversâ; labro sinuoso, reflexo; columellâ lævi.

Shell obtusely conical, subcarinate, longitudinally striate, with white and red flame-shaped bands, beneath furnished with many series of reddish spots, widely umbilicate; whorls five, above flattened, below rather convex; aperture transverse; outer lip sinuous, reflexed; columella smooth.

Hab. New Granada. J. H. Gibbon, M.D.
My Cabinet.
Diam. 2·7, Length 1·2 inches.

Remarks.—This remarkably fine shell was among the collection which I owe to Dr Gibbon. In many respects it very closely resembles the *H. pellis serpentis* (Lam.). It may, however, be at once distinguished from that species by its being striate and not granulate, a character in *pellis serpentis* not noticed by Lamarck, but which exists in all I have examined. It is also a much larger shell, and much more flattened above. The umbilicus is larger, and the area around it white. Beneath these are seven revolving lines, which are red and white spotted.

PALUDINA SINISTROSA. Plate XXIII. fig. 78.

Testâ sinistrosâ, ventricoso-conoideâ, subtenui, tenebroso-corneâ, striatâ, latè umbilicatâ; suturis impressis; anfractibus quinis, valdè convexis; aperturâ subrotundatâ, intus purpurascenti.

Shell sinistral, ventricoso-conoidal, rather thin, dark horn-colour, striate, widely umbilicate; sutures impressed; whorls five, very convex; aperture nearly round, purplish within.

Hab. . . . . East Indies. Miss Hodges.
My Cabinet.
Cabinet of Miss Hodges.

Diam. 1·1, Length 1·3 inches.

Remarks.—This is the only sinistral species of *Paludina* which has come under my notice, and I am indebted to the kindness of Miss Hodges, of Salem, Massachusetts, for one of the two specimens which were in her fine cabinet. This species is so ventricose that it might be almost mistaken for an *Ampullaria*. It cannot, however, be confounded with that from the Nile (*Amp. carinata*, Caill.). The interior is purple brown, being at the edge of the lip bordered with white. Under the lens the longitudinal striæ will be observed to be very close and small.

PALUDINA VIRENS. Plate XXIII. fig. 93.

Testâ obliquâ, crassâ, subgranosâ, viridi; anfractibus subinflatis; aperturâ ovatâ.

Shell oblique, thick, somewhat granose, green; whorls rather inflated; aperture ovate.

Hab. Wahlamat, near its junction with the Columbia river. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.

Diam. ·2, Length ·4 of an inch.

Remarks.—The apices of all the specimens which Professor Nuttall gave me are destroyed, so that it is impossible to give some of the characters of this species. It is remarkably solid for so small a species.

PALUDINA NUCLEA. Plate XXIII. fig. 103.

Testâ obtusè turritâ, corneâ, lœvi; suturis impressis; anfractibus quinis; aperturâ albâ, ovatâ.

Shell obtusely turrited, solid, horn-colour, smooth; sutures impressed; whorls five; aperture white, ovate.

Hab. Wahlamat, near its junction with the Columbia river. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.

Diam. ·2, Length ·4 of an inch.

Remarks.—This is a small solid species, and is more oblique than *P. decisa* (Say). Like it, the apex is usually cut off. Round the mouth there is a black border, which contrasts with the pale horn-coloured epidermis.

PALUDINA NICKLINIANA. Plate XXIII. fig. 109.

Testâ turritâ, viridi, lævi; apice obtuso; anfractibus quaternis, convexis; aperturâ ovatâ.

Shell turrited, green, smooth; apex obtuse; whorls four, convex; aperture ovate.

Hab. Hot Springs, Virginia. P. H. Nicklin.
My Cabinet.
Cabinet of Mr Nicklin.
Diam. 2-20ths, Length 3-20ths of an inch.

Remarks.—This shell, with several other species, was brought by Mr Nicklin from the Hot Springs of Virginia, and kindly placed in my cabinet. It lives in a rivulet, whose channel is supplied by the waters of a hot and a cold spring. The *Physa aurea* inhabits the same stream. It is the smallest species I know in our country, except the *granosa* of Say. It is rather larger, and very much resembles the *viridis* (Lam.). Its habitat, however, is very different, as the *viridis* lives in "cold fountains."

MELANIA TROOSTIANA. Plate XXIII. fig. 86.

Testâ elevatâ, fuscâ, multistriatâ; apice acuto; anfractibus decem, suprà carinatis; aperturâ ovatâ.

Shell elevated, brown, thickly striated; apex acute; whorls ten, above carinate; aperture oval.

Hab. Mossy Creek, Jefferson County, Ten. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.
Cabinet of Mr Hyde.
Diam. ·5, Length 1·2 inches.

Remarks.—I owe to Professor Troost this interesting species. It differs from any American species with which I am acquainted, in having a sharp carina, which is placed on the inferior part of the superior whorls. In its numerous striæ it resembles the *M. multilineata* (Say), which is now I believe acceded to be only a variety, much striated, of *M. virginica* of the same author. Most of the specimens which have come under my notice are white inside, with a purple spot on the columella, and an indistinct light band along the inferior part of the suture. Some individuals are, however, entirely purple inside, and this gives the epidermis quite a black appearance.

NOTE.—When I described a *Melania* under the name of *tuberculata*, I had not seen Spix's work on the fresh water shells of Brazil. Finding there the same name used for a *Melania*, mine must of course be changed, and I would propose the name of *Spixiana* for it.

MELANIA PLICIFERA. Plate XXIII. fig. 90.

Testâ acuto-turritâ, subcrassâ, tenebrosâ; spirâ pliciferâ; apice truncato; anfractibus convexiusculis, ultimo supernè lœvi, infernè striato; aperturâ albâ.

Shell acutely turrited, rather thick, nearly black; spire full of folds; apex truncate; whorls somewhat convex, the last being smooth above and striate below; aperture white.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.

Diam. ·4, Length 1·1 inches.

Remarks.—Among the fine shells brought by Professor Nuttall from beyond the Rocky Mountains, was this single species of *Melania*. It is remarkable for its numerous folds, or ribs, which fill the superior whorls. The inferior whorl is entirely without these ribs, but the inferior portion is furnished with transverse striæ. I am indebted to Professor Nuttall for many specimens of this shell, all of which are more or less truncate at the apex. The most perfect one, which is small, has nine whorls.

CYCLOSTOMA POPAYANA. Plate XXIII. fig. 76.

Testâ obtuso-convexâ, albidâ, pellucidâ, longitudinaliter striatâ, latè umbilicatâ, unifasciatâ; anfractibus quaternis; apice acuminato; labro acuto; operculo subcrasso.

Shell obtusely convex, whitish, translucent, longitudinally striate, widely umbilicate, with a single band; whorls four; apex pointed; lip sharp; operculum rather thick.

Hab. New Granada, near Popayan. J. H. Gibbon, M.D.
My Cabinet.
Diam. ·8, Length ·5 of an inch.

Remarks.—Brought by Dr Gibbon from his recent expedition to South America. It very closely resembles *C. striata* (nobis), but may at once be distinguished by its longitudinal striæ, the *striata* being transversely striate. The specimens were generally worn. That which is represented is the only one which had any part of the epidermis remaining.

LYMNEA SOLIDA. Plate XXIII. fig. 91.

Testâ elevato-conicâ, solidâ, lævi, corneâ; spirâ subturritâ; anfractibus quinis; columellâ reflexâ; aperturâ subovatâ.

Shell acutely conical, solid, smooth, horn colour; spire rather turrited; whorls five; columella reflected; aperture subovate.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.
Diam. 5-20ths, Length 8-20ths of an inch.

Remarks.—A single specimen of this species was among the shells given to me by Professor Nuttall. It differs from any species which I know, in being more solid. In this specimen the interior is brownish.

Continuation of Mr Lea's Paper. Read, July 21st, 1837.

UNIO RANGIANUS. Plate XVIII. fig. 56.

Testâ obliquâ, subcompressâ, valdè inæquilaterali; valvulis subcrassis; natibus prominentibus; dentibus cardinalibus parvis; lateralibus longis rectisque; margaritâ albâ.

Shell oblique, somewhat compressed, very inequilateral; valves rather thick; beaks prominent; cardinal teeth small; lateral teeth long and straight; nacre white.

Hab. Ohio River, near Cincinnati. T. G. Lea.
near Poland, Ohio. Dr Kirtland.
My Cabinet.
Cabinet of Mr Hyde.
Cabinet of Dr Kirtland.

Diam. .8, Length 1·2, Breadth 1·8 inch.

Shell oblique, somewhat compressed, flattened before the umbonial slope, very inequilateral; substance of the shell rather thick before, thinner behind; beaks prominent; ligament rather short; epidermis yellowish, covered with numerous green rays; cardinal teeth small; lateral teeth long and straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed on the inferior part of the cardinal tooth; cavity of the shell small; cavity of the beaks angular; nacre white.

Remarks.—This shell has been known to our naturalists for some years, and has usually been considered a variety of *U. perplexus* (nobis), without the tubercles. In some of their characters they agree entirely, and the female, in both, has the same spreading out of the posterior inferior portion, which is usually of a darker green. It is a smaller shell than *perplexus*, and may be distinguished at once by its want of tubercles and by its having nearly equidistant distinct marks of growth which are scarcely visible in the other. In some of its characters it resembles *U. capsæformis* (nobis), but that shell is elliptical while this is oblique.

I owe to Dr Kirtland a fine suite of male and female specimens, and it was the examination of these which induced me to assign a distinct place for it among the species.

I name it after an ardent student of the Mollusca, Mons. Sander Rang.

ANODONTA PEPINIANUS. Plate XVI. fig. 51.

Testâ trapezio simili, inqœuilaterali, transversâ; valvulis tenuibus; natibus prominentibus; clivo umboniali subelevato; epidermide striatâ; margaritâ albâ.

Shell trapezoidal, inequilateral, transverse; valves thin; beaks prominent; umbonial slope rather elevated; epidermis striated; nacre white.

Hab. Lake Pepin, Portage County, Ohio. B. Tappan, Esq.
My Cabinet.
Cabinet of Judge Tappan.

Diam. ·7, Length 1·2, Breadth 2 inches.

Shell trapezoidal, rather inflated, flattened on the sides, carinate behind, inequilateral, transverse; substance of the shell thin; beaks prominent; umbonial slope rather elevated and rounded; epidermis transversely striated, with the lines of growth strongly marked and apparently without rays. Anterior and posterior cicatrices both confluent; dorsal cicatrices in the centre of the cavity of the beaks; cavity of the shell rather deep; cavity of the beaks rather deep; nacre white.

Remarks.—I owe this shell to the kindness of my friend, Judge Tappan, who informs me that has observed it only in Lake Pepin. In its colour, and being fragile, it resembles the *An. fragilis* (Lam.). It may be distinguished from any of our species by its trapezoidal outline. The two specimens in my possession, are both in the nacre slightly incrusted with yellow spots. The smaller one being young and having the beaks perfect, exhibits numerous fine undulations at the tip.

The specimen represented is of the largest size which Judge Tappan has seen.

ANODONTA ANGULATA. Plate XVI. fig. 52.

Testâ obovatâ, snbinflatâ, valdè inœquilaterali; valvulis subtenuibus, natibus subprominulis; clivo umboniali carinato; epidermide luteolâ, subradiatâ; margaritâ albâ.

Shell obovate, rather inflated, very inequilateral; valves rather thin; beaks somewhat prominent; umbonial slope carinate; epidermis yellow, somewhat radiated; nacre white.

Hab. Lewis's River. Professor Nuttall.

My Cabinet.

Diam. ·8, Length 1·1, Breadth 2·4 inches.

Shell obovate, rather inflated, flattened before and behind the umbonial slope, very inequilateral; substance of the shell rather thin; beaks somewhat prominent; umbonial slope acutely carinate; epidermis yellow, obscurely radiated on the posterior slope dark green; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell rather deep and angular; cavity of the beaks shallow; nacre white.

Remarks.—A single valve, and that with a small fracture, of this species was brought by Professor Nuttall. It is very peculiar in possessing a carinate umbonial slope, and might, on account of this character, at first sight be mistaken for a wide specimen of *Margaritana marginata*. In this individual the cavity of the beak is salmon colour, but this may not be a permanent character. The anterior margin being small, and the posterior one large, gives it the outline of a *Modiola.*

Among the shells of this family brought from the Columbia River by this distinguished traveller and naturalist, were several specimens of *Margaritana margaritifera*. To find that this species inhabits the waters flowing into the Pacific, is of peculiar interest. Its being common to the European rivers and those of the United States flowing into the Atlantic, gave it an importance in regard to its geographical distribution, which had attracted attention, as it is the only species which has been observed on both continents. Its discovery, now, in the Columbia River, adds much to that interest, as it proves it to exist on a very large portion of the circuit of our globe. It should be remarked that the nacre of these specimens is purple, a character not observed from other localities. In all other characteristics there is not apparently any difference whatever.

CAROCOLLA HYDIANA. Plate XXIII. fig. 73.

Testâ orbiculatâ, utrinque convexâ, subfuscâ, minutè granulatâ, latè umbilicatâ; anfractibus quinis; aperturâ subtriangulatâ, plicis quaternis inæqualibus coarctatâ; marginibus connexis, reflexis, subrufis.

Shell orbicular, on both sides convex, brownish, minutely granulated, widely umbilicate; whorls five; aperture subtriangular, contracted, with four unequal folds; margin continuous, reflected, reddish.

Hab. near Porto Cabello, S. A. J. H. Gibbon, M.D.
My Cabinet.
Cabinet of Mr Hyde.

Diam. 1·9, Length ·9 of an inch.

Remarks.—I owe the possession of this fine shell to the kindness of Dr Gibbon. It resembles so closely *C. labyrinthus* (Lam.), that I have had some hesitation in proposing it as a new species. There appears, however, to be a difference in the form of the mouth, in the number of the teeth, and in the surface being minutely granulate. The figure in Wood's Catalogue (*H. plicata, No.* 27), is no doubt intended to represent Lamarck's *labyrinthus*, but the lower part of the mouth seems to be represented by three distinct folds. In some specimens of our shell the fourth tooth is wanting, and I presume this is owing to its immaturity. I have great pleasure in dedicating this species to my friend William Hyde, Esq.

HELIX CALIFORNIENSIS. Plate XXIII. fig. 79.

Testâ globosâ, imperforatâ, granosâ, fuscâ, unifasciatâ; anfractibus quinis; aperturâ subrotundatâ; labro reflexo; columellâ lævi.

Shell globose, imperforate, granose, brownish, single banded; whorls five; aperture nearly round; outer lip reflected; columella smooth.

Hab. St Diego, Upper California. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.
Diam. ·7, Length ·6 of an inch.

Remarks.—This species is remarkable for its globoseness and the single small dark band placed in the middle of a light and broader one immediately above the centre of the whorl.

HELIX TOWNSENDIANA. Plate XXIII. fig. 80.

Testâ obtuso-conicâ, longitudinaliter striatâ, rugosâ, fuscâ, umbilicatâ; anfractibus quinis; aperturâ subrotundatâ; labro reflexo; columellâ lævi.

Shell obtusely conical, longitudinally striate, rough, brownish, umbilicate; whorls five; aperture nearly round; lip reflected; columella smooth.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.
Diam. 1, Length ·6 of an inch.

Remarks.—In general form, and nearly in size, this species resembles *H. thyroidus* (Say), but differs from it in being of a darker colour and in being rugose. Under the microscope minute transverse striæ may be observed. The lip is beautifully white, and the last whorl near its termination yellow. I name it after Mr Townsend, who accompanied Professor Nuttall in his travels to the Pacific.

HELIX NICKLINIANA. Plate XXIII. fig. 84.

Testâ subglobosâ, tenuiculâ, albidâ, longitudinaliter striatâ, nubilâ, perforatâ, unifasciatâ; anfractibus quinis; aperturâ rotundatâ; labro subreflexo; columellâ lævi.

Shell subglobose, rather thin, whitish, longitudinally striate, clouded, perforate, single banded; whorls five; aperture round; lip slightly reflected; columella smooth.

Hab. St Diego, Upper Calefornia. Professor Nuttall.
My Cabinet.
Cabinet of Professor Nuttall.
Diam. ·9, Length ·7 of an inch.

Remarks.—This species resembles *H. Caleforniensis* (herein described), but differs in being less globose and in having no broad light band, as well as in being larger. The whole shell, except the apex, is mottled, the inferior part of the whorls being lighter. In the specimens before me the umbilicus is very nearly closed.

HELIX OREGONENSIS. Plate XXIII. fig. 85.

Testâ subcarinatâ, tenui, lævi, rufo-fuscâ, ad carinam bifasciatâ, supernè subconvexâ, infernè subinflatâ.

Shell subcarinate, thin, smooth, reddish brown, double banded on the carina, above slightly convex, below somewhat inflated.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall.
My Cabinet.
Cabinet of Professor Nuttall.
Diam. ·6, Length ·4 of an inch.

Remarks.—It is much to be regretted that Professor Nuttall was unable to procure a mature specimen of this beautiful species. The description being made from a young individual is, of course, defective. It is impossible to say whether it be umbilicate and whether it may possess a reflected lip when mature. It may also acquire a much larger size. It is remarkable for a dark brown and a white band on the carina. That part of the specimen which has the epidermis, presents in it, under the microscope, a remarkable waved appearance.

SUCCINEA APERTA. Plate XXIII. fig. 107.

Testâ subrotundâ, tenui, flavescente, lævi; spirâ brevissimâ; anfractibus binis, ultimo grandissimo; aperturâ latissimâ.

Shell subrotund, thin, yellowish, smooth; spire very short; whorls two, the last being very large; aperture very wide.

Hab. Banks of Columbia River. Professor Nuttall.
My Cabinet.
Cabinet of Professor Nuttall.
Diam. ·4, Length ·5 of an inch.

Remarks.—This is one of the interesting shells brought by Mr Nuttall. It is remarkable for its fullness, for the size of the last whorl, and its mammiform apex, which is remarkably small.

PALUDINA NUTTALLIANA. Plate XXIII. fig. 89.

Testâ subglobosâ, corneâ, lævi; suturis subimpressis; anfractibus quaternis; aperturâ albâ, subrotundâ.

Shell subglobose, horn-coloured, smooth; sutures rather impressed; whorls four; aperture white, nearly round.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.
Diam. ·3, Length ·4 of an inch.

Remarks.—There is a very close resemblance between this species and *P. nuclea* (herein described). It is, however, less oblique, larger, and less elevated in the spire.

LYMNEA APICINA. Plate XXIII. fig. 94.

Testâ obtuso-conicâ, subsolidâ, lævi, corneâ; spirâ breviusculâ; anfractibus quaternis; columellâ reflexâ; aperturâ subovatâ.

Shell obtusely conical, rather solid, smooth, horn-coloured; spire rather short; whorls four; columella reflected; aperture subovate.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall.

My Cabinet.
Cabinet of Professor Nuttall.
Diam. ·3, Length ·4 of an inch.

Remarks.—This small species is rather more globose than usual. It is distinguished by a dark apex. Within the outer lip there is a dark brown band.

Continuation of Mr Lea's Paper. Read, January 5th, 1838.

Unio dolabræformis. Plate XXIV. fig. 113.

Testâ ellipticâ, inflatâ, inæquilaterali; valvulis crassis; natibus inflatis prominentibusque; epidermide lævi; dentibus cardinalibus sublamellatis; lateralibus longis lamellatisque; margaritâ albâ et iridescente.

Shell elliptical, inflated, inequilateral; valves thick; beaks inflated and prominent; epidermis smooth; cardinal teeth somewhat lamellar; lateral teeth long and lamellar; nacre white and iridescent.

Hab. Altamaha River, Liberty County, Georgia. Lewis Leconte, Esq.

Hab. Altamaha River, near Darien. Professor Ravenel.

My Cabinet.
Cabinet of Major Leconte.
Cabinet of Professor Ravenel.

Diam. 2·1, Length 3, Breadth 4·5 inches.

Shell elliptical, inflated, inequilateral; substance of the shell thick, thinner on the posterior portion; beaks inflated and prominent; ligament rather short and very thick; epidermis brown, finely wrinkled, polished; umbonial slope somewhat carinate, obscurely rayed; cardinal teeth not very large, compressed; lateral teeth long, lamellar, curved, and separated from the cardinal teeth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices very large, and placed on the inside of the plate between the cardinal and lateral teeth; cavity of the shell large and deep; cavity of the beaks large and subangular; nacre pearly white, iridescent, sometimes pinkish in the teeth and cavity of the beaks.

Remarks.—There is a group of *Uniones* to which this belongs, which have a close resemblance to each other in nearly all their characteristics. The *U. ovatus* (Say) may be considered the type of this group, and it has been with some hesitation that I have added another species. The *dolabræformis* stands between *ovatus* (Say) and *occidens* (nobis), and when young I should suppose would resemble *U. globosus* (Lea). This shell was among those sent by Lewis Leconte, Esq. to his brother, to whom I am greatly indebted for the possession of many fine species. The strong resemblance this species bore to the *occidens* (nobis) induced me to defer, when I described the other new ones, the description of this for better specimens to decide upon. The acquisition of several fine ones from Professor Ravenel no longer left any doubt in my mind of the propriety of proposing it as a new species. The female shell, like the *occidens*, is very broad at the posterior margin.

UNIO NOVI-EBORACI. Plate XXIV. fig. 114.

Testâ ellipticâ, subcompressâ, inæquilaterali; valvulis subcrassis; natibus subprominentibus, ad apices undulatis; epidermide luteolâ, radiatâ; dentibus cardinalibus magnis erectisque; lateralibus longis rectisque; margaritâ albâ et iridescente.

Shell elliptical, somewhat compressed, inequilateral; valves rather thick; beaks somewhat prominent, undulated at the tip; epidermis yellow and radiated; cardinal teeth large and erect; lateral teeth long and straight; nacre white and iridescent.

Hab. Oak Orchard Creek, Orleans County, New York. J. C. Jay, M.D.

My Cabinet.
Cabinet of Dr Jay.

Diam. ·7, Length 1·1, Breadth 2·2 inches.

Shell elliptical, somewhat compressed, inequilateral; substance of the shell rather thick, thinner on the posterior portion; beaks somewhat prominent, and minutely undulated at the tip; epidermis yellow, with green rays nearly over the whole disk; cardinal teeth large, erect and deeply cleft in the left valve; lateral teeth long, straight, and separated from the cardinal teeth; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the centre of the cavity of the beaks; cavity of the shell shallow; cavity of the beaks subangular and shallow; nacre white, and very iridescent on the posterior portion.

Remarks.—This species more nearly resembles *U. iris* (nobis) than any other I am acquainted with. It is, however, a thicker shell, more angular behind, and not quite so transverse. The epidermis is more yellow. I am indebted to the kindness of Dr Jay for the specimen in my cabinet, from which the figure is taken.

UNIO CLAIBORNENSIS. Plate XXIV. fig. 115.

Testâ ellipticâ, subinflatâ, inæquilaterali; valvulis crassis; natibus subprominentibus; epidermide luteolâ, lævi; dentibus cardinalibus parvis; lateralibus longis lamellatisque; margaritâ albâ et iridescente.

Shell elliptical, somewhat inflated, inequilateral; valves thick; beaks somewhat prominent; epidermis yellow, smooth; cardinal teeth small; lateral teeth long and lamellar; nacre white and iridescent.

Hab. Alabama River, near Claiborne. Judge Tait.
My Cabinet.

Diam. ·6, Length 1, Breadth 1·7 inches.

Shell elliptical, somewhat inflated, inequilateral; valves thick; beaks somewhat prominent; ligament rather long and thin; epidermis yellow, smooth, with a few obsolete rays; cardinal teeth small and compressed; lateral teeth long, lamellar, and nearly straight; anterior cicatrices distinct; posterior cicatrices confluent; dorsal cicatrices placed in the interior of the cavity of the beaks; cavity of the shell not very deep; cavity of the beaks small; nacre pearly white and iridescent.

Remarks.—Among the number of fine shells sent to me some years since by the late Judge Tait, was one whole specimen and an odd valve of this shell. In hopes of procuring more and better specimens, I delayed bringing it forward as a new species, and regret now to have to figure and describe an individual not mature, the odd valve being considerably larger. It has a strong resemblance to *U. luteolus* (Lam.) and to *U. Hydianus* (nobis), but does not, like them, possess distinct rays.

ANODONTA SUBCYLINDRACEA. Plate XXIV. fig. 117.

Testâ ellipticâ, inflatâ, subcylindraceâ, valdè inæquilaterali; valvulis tenuibus; natibus subprominentibus undulatisque; epidermide fuscâ; margaritâ subcœruleâ et iridescente.

Shell elliptical, inflated, nearly cylindrical, very inequilateral; valves thin; beaks somewhat prominent and undulated; epidermis brown; nacre bluish and iridescent.

Hab. Oak Orchard Creek, Orleans County, New York. J. C. Jay, M. D.

My Cabinet.
Cabinet of Dr Jay.

Diam. ·8, Length 1·1, Breadth 2·2 inches.

Shell elliptical, inflated, rounded at both ends, nearly cylindrical, very inequilateral; substance of the shell very thin; beaks somewhat prominent and minutely undulated at the tip; epidermis brown, and without rays; anterior cicatrices confluent; posterior cicatrices confluent; dorsal cicatrices not perceptible; cavity of the shell deep; cavity of the beaks very shallow; nacre bluish and iridescent.

Remarks.—This *Anodonta* resembles, particularly in an immature state, the *An. Ferussaciana* (nobis). It is not, however, so large a shell, and the beak is more terminal. The undulations of the beaks, which are nearly concentric, are also smaller. Dr Jay very kindly placed the shell above described at my disposal many months since.

POLYGYRA DORFEUILLIANA. Plate XXIV. fig. 118.

Testâ supernè obtuso-conicâ, infernè subinflatâ, nitidâ, corneâ, longitudinaliter striatâ, latè umbilicatâ ; anfractibus senis ; aperturâ lunatâ, tridentatâ.

Shell above obtusely conical, below somewhat inflated, shining, horn-colour ; longitudinally striate, widely umbilicate ; whorls six ; aperture lunate, three-toothed.

Hab. Ohio. Mr Dorfeuille, Cincinnati.
My Cabinet.
Diam. ·3, Length ·2 of an inch.

Remarks.—I adopt Mr Say's genus *Polygyra*, believing the division, though very artificial, quite as good as many made by Lamarck. This species has, like *Polygyra fatigiata* (Say) and *P. plicata* (Say), one large tooth on the left lip and two smaller ones on the right lip. It differs from the first in not being carinate, from the last in being larger and having larger striæ. In the *Dorfeuilliana* the tooth on the left lip is large and square, with an indentation in the centre. The view into the mouth is nearly obstructed by the teeth, leaving, to appearance, three nearly square apertures. The superior part of the shell is striate, while the inferior part is nearly smooth, and exhibits two volutions. I have seen but a single specimen, which I believe is the only one obtained by Mr Dorfeuille, who obligingly sent it to me.

POLYGYRA TROOSTIANA. Plate XXIV. fig. 119.

Testâ supernè subplanulatâ, infernè subinflatâ, corneâ, longitudinaliter striatâ, latè umbilicatâ ; anfractibus senis ; aperturâ lunatâ, tridentatâ.

Shell above nearly flat, below somewhat inflated, horn-coloured, longitudinally striate, widely umbilicate ; whorls six ; aperture lunate, three-toothed.

Hab. Tennessee. Professor Troost.
My Cabinet.
Cabinet of Professor Troost.
Diam. ·4, Length ·2 of an inch.

Remarks.—This species strongly resembles *P. Dorfeuilliana*, herein described, being nearly of the same size, and possessing most of its characters. It differs, however, in the large solid tooth on the left lip being more angular, and in the two teeth on the right lip being somewhat differently placed. In the striæ it differs much, these being larger, much better defined, and passing entirely over the whorls. In the umbilicus it is wider, and shows more of the two whorls. This shell forms the fourth of a group, the form of the apertures of which is exceedingly alike, viz. *P. fatigiata* (Say), *P. plicata* (Say), and *P. Dorfeuilliana* (nobis).

Continuation of Mr Lea's Paper. Read, January 19*th*, 1838.

Unio Brownianus. Plate XXIV. fig. 116.

Testâ trigonâ, inflatâ, valdè inæquilaterali, alatâ; valvulis crassis; natibus prominentibus; epidermide striatâ; dentibus cardinalibus subgrandibus; lateralibus longis; margaritâ albâ.

Shell triangular, inflated, very inequilateral, winged; valves thick; beaks prominent; epidermis striated; cardinal teeth rather large; lateral teeth long; nacre white.

Hab. River Amazon, South America. Captain George Brown.
My Cabinet.
Cabinet of Captain Brown.

Diam. 1, Length 1, Breadth 2 inches.

Shell triangular, inflated, very inequilateral, winged on the posterior part; substance of the shell thick; beaks prominent; ligament rather long and thin; epidermis dark brown, finely striate, and polished on the umbones; umbones inflated; umbonial slope carinate; cardinal teeth rather large and striate; lateral teeth long and nearly straight; anterior cicatrices distinct, the smaller being situated *above* the large one; posterior cicatrices confluent; dorsal cicatrices very small; cavity of the shell rather deep; cavity of the beaks shallow.

Remarks.—This shell belongs to Lamarck's genus *Hyria*, which, in my proposed arrangement, I have placed among the *Uniones* having one cardinal and one lateral tooth. I am induced to believe in the propriety of this remaining so, until we shall have a better knowledge of the whole family, and of course a natural arrangement. In a previous memoir* I noticed the fact, that in the genus *Hyria* the cicatrix of the extensor muscle was placed over that of the anterior adductor muscle. In the *Brownianus* we find them in the same relative position.

I am indebted to Captain Brown for the examination of three specimens of this species, which he brought from the Amazon, with the other two species already known to exist there. It most resembles *H. syrmatophora*, but differs from it in being more transverse, being less carinate, having a shorter cardinal tooth, which is more striate, and in having a wing much less elevated. The umbones are also more inflated before the umbonial slope. It may be proper to remark here, that in some individuals of the genus *Hyria* an imperfect crenulation of the lateral tooth may be found, somewhat similar to the genus *Castalia* (Lam.), and this is the case with one of the specimens of the species proposed above.

---

* Vol. I., p. 77.

SYSTEMATIC INDEX.

Page

Unio arctior - - - 10
  Barnesianus - - 31
  Bengalensis - - - 3
  Brownianus - - 108
  carbonarius - - - 37
  Claibornensis - - 105
  coccineus - - - 12
  contradens - - 75
  creperus - - - 33
  Cumberlandicus - - 25
  discus - - - 74
  dolabræformis - - 103
  Dorfeuillianus - - 73
  Fisherianus - - 8
  folliculatus - - - 38
  gibber - - - 35
  glaber - - - 34
  graniferus - - 69
  Hopetonensis - - - 29
  Hydianus - - - 14
  interruptus - - - 15
  Jayensis - - - 28
  jejunus - - - 9
  lamellatus - - - 19
  Lecontianus - - - 40
  lugubris - - - 30
  Medellinus - - - 39
  Menkianus - - 76

Page

Unio Muhlfeldianus - - 41
  notatus - - - 28
  Novi-Eboraci - - 104
  obscurus - - - 7
  pliciferus - - - 61
  pulcher - - - 6
  pumilus - - - 23
  Rangianus - - 95
  Roanokensis - - - 27
  simus - - - 26
  splendidus - - - 70
  spinosus - - - 57
  solidus - - - 13
  Tampicoensis - - 24
  Tappanianus - - - 62
  turgidus - - - 11
  Vanuxemensis - - 36
  Vaughanianus - - 5
  venustus - - - 4
  Zeiglerianus - - 32
Margaritana arcula - - - 71
  deltoidea - - 43
  fabula - - - 44
  Holstonia - - 42
Anodonta angulata - - - 97
  Buchanensis - - 47
  cylindracea - - 45
  decora - - - 64

Page

- Anodonta exilis - 81
  - gigantea - 1
  - Newtoniensis - 79
  - Nuttalliana - 77
  - Oregonensis - 80
  - ovata - 2
  - Pepiniana - 96
  - pavonia - 78
  - salmonia - 45
  - subcylindracea - 106
  - Wahlamatensis - 78
  - Wardiana - 46
- Iridina cœlestis - 82
- Helix Californiensis - 99
  - Columbiana - 89
  - magnifica - 89
  - Mitchelliana - 87
  - Nickliniana - 100
  - Nuttalliana - 88
  - Oregonensis - 100
  - Townsendiana - 99
  - Vancouverensis - 87
  - Wardiana - 67
- Carocolla Hydiana - 98
- Polygyra Dorfeuilliana - 107
  - Troostiana - 107
- Bulimus Columbianus - 66
  - corneus - 66
  - decoratus - 86

Page

- Bulimus Gibbonius - 85
  - glandiformis - 83
  - gracilis - 85
  - lacteus - 65
  - maculatus - 86
  - parvus - 84
  - Pealianus - 65
  - virgo - 84
- Succinea aperta - 101
- Megaspira Ruschenbergiana - 21
- Cyclostoma maculata - 68
  - Popayana - 94
- Planorbis lens - 68
- Physa aurea - 18
- Lymnea solida - 94
  - apicina - 102
- Melania inflata - 17
  - plicata - 20
  - plicifera - 93
  - Troostiana - 92
- Paludina hyalina - 17
  - Nickliniana - 92
  - nuclea - 91
  - Nuttalliana - 101
  - pallida - 22
  - sinistrosa - 90
  - virens - 91
- Ampullaria Pealiana - 16

Continuation of Mr Lea's Paper.

SYNOPSIS

OF

THE FAMILY OF NAIADES.

The following table of arrangement and synonymy was undertaken purely with the view and in the hope of clearing away the difficulties which had incumbered one of the most interesting families of the Mollusca. In this attempt the author met, while pursuing his task, with obstructions and difficulties which he little anticipated at its commencement. The want of some of the books of reference, and the confusion which reigned throughout many of them, sometimes presented obstacles which seemed almost insurmountable. In attempting to establish the synonymy, he has endeavoured to render the strictest justice, and if in any case it is found he has failed to do this, it will be a matter of sincere regret to him.

In the following tables there will be found in the family 323 recent species as admitted, 29 unknown to me or doubtful, and 22 fossil; in all 374.

Of the subgenus *Unio*, there are 235 species in a recent state, and 20 which I have not been able to admit as certain; of fossil species 21.

Of the subgenus *Margaritana* there are 20 admitted species, and 2 which are unknown to me.

Of the subgenus *Dipsas* I know of but 2 species, both of which are recent.

Of the subgenus *Anodonta* there are 58 admitted species, and 7 which are unknown to me. Of fossil species there is one which is doubtful.

The subgenus *Iridina* has 2 species, both recent.

The subgenus *Spatha* has 6 species, all recent.

Most of the distinguished authors who have written on the subject of the division of the Family *Naïades* of Lamarck, have acknowledged the extreme difficulty they have encountered in separating it into subdivisions. This difficulty is not peculiar to the *Naïades*. In most of the families where a great number of species have been observed, we find these species so merging, and in some of their characters so fading away into each other, that we scarcely know how, indeed in some instances it is impossible, to make the separation with precision. "Natura non facit saltum." In the vegetable kingdom the same obstructions to a system are encountered. The observations of Lindley* are so just and philosophic, that I cannot refrain from quoting them here:—

"Species are created by Nature herself, and remain always the same, in whatever manner they may be combined: they form the basis of all classification, and are the only part of it which can be considered absolute. For although in a natural system, all other combinations, whether genera, tribes, orders, or by whatever name they may be known, comprehend species agreeing much more with each other than with any thing else, and having a positive general resemblance in the majority of their features, yet no fixed limits can be assigned to any of them; on the contrary, they pass, by means of various intermediate species, into the other genera, tribes, orders, &c., to which they are most nearly allied. For this reason, viz., that no fixed limits can be assigned to orders, genera, &c., we find the ideas about them fluctuating with the degree of our knowledge; which is the true cause of those changes in the limits of genera, &c., which persons unacquainted with the subject are apt to consider arbitrary; but which, in skilful hands, are dependent upon a progressive advance in the knowledge of science."

---

* See Introd. to Botany, p. 307.

Blainville, in his "Manuel de Malacologie," divides the *Naïades* (his *Sub-Mytilacea*) into *Anodonta* and *Unio*, but thinks that species will be found which will make these to be united.*

Sowerby says, "the difficulty of ascertaining to which genus of Lamarckian *Naïades* certain species belong, arises from the very general similarity of form," &c.; "in fact, an examination of a sufficient number of species will prove that no dependence can be placed upon the characters by which authors usually attempt to discriminate between these genera, and that the transition from one to another is so gradual in some instances, and so strongly marked in others, that it is not surprising that authors who having only met with certain species, and not being aware of such intermediate links, should have considered them as the types of new genera."† And further, "we think we have already said enough to prove, that unless it be thought wise to elevate each of the peculiar sorts we have mentioned, and many more, into distinct genera, it will be positively necessary to unite them altogether under one generic appellation." Swainson (Zool. Illus., second series) divides this family into *Unio*, *Hyria*, *Iridina*, *Anodon*, and *Alasmodon*, but in describing *An. areolatus* speaks of the genera gliding into each other.

Deshayes, in his edition of Lamarck's "Animaux sans Vertebres," says it is impossible to separate the genera of the *Naïades*. "Nous pourrions prendre pour exemple celui des genres qui est consideré comme l'un des mieux caractérisés. Le genre *Symphynote* est fondé sur ce caractere remarkable que les deux valves sont soudées entre elles le long du bord superieur," etc. "Nous concluons que tout ce grand ensemble ne peut et ne doit former qu'un seul genre constituent a lui seul la famille des *Nayades*."*

---

* See page 540.

† Zool. Journ. Vol. I.

It might be expected that some attempt of the application of M'Leay's circular system should be made in regard to this family. Swainson says that "the progression of every natural series is in a circle."† In my attempts to verify this, I have not been successful. That the same idea exists in the construction of species is evident through a great number, but that this idea is returned to the point at which it commenced I am not prepared to admit.

To form a systematic, and, so far as possible, a natural arrangement of this family, has long occupied my serious attention.

I was, from my first knowledge of the family, struck with the very different aspect of the winged species, and, taking the hint of Lamarck,‡ I thought that an important division could be made by separating the connate from the free shells, and proposed the name of *Symphynota* for such as were connate. I was not satisfied at that time in separating a genus of this family by a character differing from that of the teeth, but presumed that the family would be taken up by some one, if not by myself, and that the first division of it would be symphynote and non-symphynote *Naïades*. The numerous new species which have been made known since, have satisfied me that this character cannot be so extensively and usefully applied as I then thought it could, and that it is not in fact free from the same objection which pervades so many generic characters as adopted by the most intelligent naturalists, viz. that perfect fading and mingling of character which interferes with all the systems yet formed.

---

* Vol. VI. p. 526.—I will be excused in taking this opportunity to correct an erroneous impression on the mind of M. Deshayes. He says that I was not able to examine the collection of the Museum of Paris. "Malgré cette imperfection qu'il ne pouvait empêcher, le travail de M. Lea se recommende à l'attention des naturalistes par ces observations judicieuses, des descriptions exactes," etc. It would be strange, indeed, if after spending so many years in the study of this family, that I should neglect, while in Paris, to see the collections from which Lamarck made so many descriptions. I was frequently at the museum, and on one particular occasion, by appointment of MM. Blainville and Ferussac, arranged, in the presence of these and other gentlemen, all the species of the *Naïades* that were in the museum, and named them; and also presented to the museum about fifteen species which were new to that great national institution. I also did the same thing for Baron Ferussac, having designated every specimen in his cabinet belonging to this family.

† Swainson, in Lard. Cycl. Nat. Hist. p. 247.

‡ Vol. VI. p. 76.

Sowerby, after examining into the propriety of dividing the family into genera, came to the conclusion of keeping but one genus, viz. *Unio:* this he divided into A without teeth, B with teeth. These he subdivided into winged and not winged. Another subdivision followed these, on the presence, form, and absence of teeth. There is evidently much merit in this division; but it is not perfect; nor ought we to expect perfection, I believe, in any system. Ferussac informed me, when in Paris, that he proposed to consider the Family *Naïades* to consist of one genus, *Margaritifera,* which genus he divides into the following subgenera: 1. *Anodonta;* 2. *Iridina;* 3. *Dipsas;* 4. *Triquetra;*[*] 5. *Alasmodonta*; 6. *Unio.*

In Vol. 3 of our Trans. p. 398, Mr Nicklin expresses the opinion "that the seven genera, now referred to the family of *Naïades,* are founded in artificial distinctions, and not in nature; and that in fact the family contains but one genus."

After mature reflection, I have come to the conclusion, in forming this systematic arrangement and catalogue, to divide the family into two genera, *Margarita* and *Platiris,* and both of these into *subgenera.* Under this system, the best place for the symphynote shells would be a division of the subgenera into Symphynote and Non-Symphynote.

---

[*] Klein. This it would appear Baron F. intended should embrace my genus *Symphynota,* as he included all he knew of them except *S. bialata.*

FAMILY NAIADES.	I. GENUS MARGARITA.	1. Subgenus Unio,	Having a cardinal and lateral tooth.	Symphynote—Unio alatus,[a] &c. Non-Symphynote—U. pictorum,[b] &c.
		2. Subgenus Margaritana,	Having one tooth (cardinal).	Symphynote—Alas. complanata,[c] &c. Non-Symphynote—Alas. undulata,[d] &c.
		3. Subgenus Dipsas,	Having a linear tooth under the dorsal margin.	Symphynote—Dipsas plicatus.[e]
		4. Subgenus Anodonta,	Having no teeth.	Symphynote—Sym. magnifica,[f] &c. Non-Symphynote—An. fluviatilis,[g] &c.
	II. GENUS PLATIRIS.	1. Subgenus Iridina,	Having a crenulate dorsal margin.	Non-Symphynote—I. exotica.[h]
		2. Subgenus Spatha,	Having the dorsal margin non-crenulate.	Non-Symphynote—I. Nilotica.[i]

After the divisions of Symphynote and Non-Symphynote shells, we have what appears to me four very natural subdivisions, viz.

---

[a] Of Say.

[b] Of Lamarck.

[c] Of Barnes.

[d] Of Say.

[e] Of Leach. Only two species yet known, this and *S. discoidea*, Lea.

[f] Lea.

[g] *Mytilus fluviatilis*, Sol., Dill. &c. *An. cataracta*, Say.

[h] Of Lamarck.

[i] Of Sowerby.

1. Plicate shells.[*]
2. Nodulous shells.[†]
3. Spinous shells.[‡]
4. Smooth shells.[§]

Each of these subdivisions may be again separated, according to the form of their outline, thus:

1. Quadrate.[a]
2. Triangular.[b]
3. Oblique.[c]
4. Oval.[d]
5. Oblong.[e]
6. Subrotund.[f]
7. Wide.[g]
8. Obovate.[h]
9. Arcuate.[i]

The shell is supposed to be lying on its side with the ligament furthest removed from the observer, and the beak to the right of it. The base will of course be nearest to him, and the anterior margin to his right, while the posterior margin will be to the left. This is my mode of arranging my whole cabinet, which contains over 2100 specimens of this family, each differing in some character or locality.

In attempting to make a complete synopsis of the *Naïades*, much labour has necessarily been expended. I do not present this as a perfect work, but it has been made as much so as the opportunities in my possession permitted. Errors may have arisen from two sources: first, default of judgment; second, from accident, owing to the mass of research necessary to accomplish the object, considering the crude state the subject was in. I shall be most agreeably disappointed if there be not parts pointed out as erroneous which are substantially correct. It will be observed that the works of M. Rafinesque are but little quoted. This has arisen from the utter impossibility of satisfying myself as to his species, causing me at an early period to abandon the task of making out his very imperfect descriptions. His own discrepancy in the names sent to Ferussac,* and those which are attached to specimens here, together with the want of accordance in the tables made out by his friends, have induced me to regard his claims as being too slender to rely upon the decisions, so contradictory, of the several parties, in the absence of the individual specimens noted. In the absence of these specimens, which no naturalist has, I believe, ever seen but the Professor, I feel myself compelled to prefer other authorities, which are now almost universally received by our men of science. I am the more fortified in this conclusion, when I see that his most ardent advocate acknowledges that he has made six species from a single one;† and the absurdity is still stronger when we turn to Professor R.'s monograph, and find that this single species has furnished *several genera*, and is placed in fact in *two different sub-families!!!*

---

[*] As Unio plicatus. *Lesueur.*

[†] As Unio pustulosus. *Lea.*

[‡] As Unio spinosus. *Lea.*

[§] As Unio complanatus. (U. purpureus. *Say.*)
No regard of course is paid in this division to the folds or undulations of the beaks, as all the species are more or less disposed to this character.

[a] As U. asperrimus. *Lea.*

[b] As U. triangularis. *Barnes.*

[c] As U. clavatus. *Lam.*

[d] As U. crassus. *Say.*

[e] As U. complanatus. *Solander.*

[f] As U. circulus. *Lea.*

[g] As U. rectus. *Lam.*

[h] As U. modioliformis. *Lea.*

[i] As M. margaritifera. (Al. arcuata. *Barnes.*)

In regard to the Catalogue published last year by Baron Ferussac, in which he gives precedence to many of Professor Rafinesque's names, it must be remembered that this has been done on the authority of others, and not from the inspection of the subjects themselves. Had he known the manner in which these claims had been brought forward, he certainly would have admitted them with doubt.

---

* "Les erreurs involuntaires qui échappent à M. Rafinesque dans ses envois augmentent aussi la difficulté de reconnaitre ses espèces. Nous avons reçu de lui les mémes coquilles sous différents noms, et d'autres avec les noms évidemment autres que ceux qu'elles portent dans sa Monographie. Il en est résulté une difficulté inextricable pour la détermination de ses espèces, et pour pouvoir établir une synonymie exacte entre lui et les autres qui, depuis, se sont occupés des Mulettes."—*Magasin de Zoologie*, p. 13.

† Conrad's Synoptical Table on New Fresh Water Shells of the United States, p. 72. *U. triangularis.*

FAMILY NAIADES.—*Lamarck.*

GENUS MARGARITA.

I. SUBGENUS UNIO.

SYMPHYNOTE UNIONES.

PLICATE.

TRIANGULAR.
*angulatus. *Lea.*†
Hyria corrugata.‡ *Lam.* *Sow.*
Mya angulata. *Wood.*
Unio corrugata. *Blain.*
Unio rugosus. *Wagner.*§
Paxyodon ponderosus. *Schum.*
Triplodon rugosus. *Spix.*§

gigas. *Lea.*
Lymnadia gigas. *Swain.*

SMOOTH.

*inflatus. *Lea.*
Symph. inflata. *Lea,* in Trans. Am. P. S.

*alatus. *Say.*
Unio alatus. *Say.* *Lam.* *Swain.* *Bar.* *Hild.*
Mya alata. *Wood.*
Symph. alata. *Lea,* Trans. Am. P. S.

*syrmatophorus. *Lea.*
Mya syrmatophora. *Gronovius.* *Gmel.* *Wood.* *Dill.*

SYMPHYNOTE UNIONES.

SMOOTH.

TRIANGULAR.
Hyria avicularis. *Lam.* *Crouch.*
Hyria syrmatophora. *Sow.*
Hyria elongata?‖ *Swain.*
Unio caudatus.§ *Wagner.*
Prisodon obliquus. *Schum.*
Prisodon truncatus. *Schum.*
Diplodon furcatum.§ *Spix.*

*Brownianus. *Lea.*

*lævissimus. *Lea.*
Symph. lævissima. *Lea,* in Trans. Am. P. S. *Eaton.*
Unio lævissima. *Deshayes.*

*gracilis. *Barnes.* *Hild.*
Unio planus. *Barnes.*
Unio fragilis. *Swain.*
Symph. gracilis. *Lea,* in Trans. Am. P. S. *Eaton.*

*compressus. *Lea.*
Symph. compressa. *Lea,* in Trans. Am. P. S.

---

* All the species preceded by an * are in my Cabinet. The inner column forms the Synonyms.

† It will be observed, throughout this *Synopsis,* that where any change has been made of generic or specific names, that I have placed my name there. This is not done with a view to claim any merit, but in accordance with that which is usually done. The object is to show the author of the change, and nothing further.

‡ This specific name having been used by the older conchologists, as well as Lamarck, for a shell from India (*Unio corrugata*), it becomes necessary, as I retain that as the older, to change this, which I do to Wood's name.

§ On the authority of Ferussac.

‖ Mr Gray thinks this to be a "perfectly distinct species." I have never seen the shell, and feel too much in doubt to insert it as such.

NON-SYMPHYNOTE UNIONES.

PLICATE.

QUADRATE.

*Nicklinianus.† *Lea.*

*cœlatus. *Con.*

*multiplicatus.‡ *Lea.*
Unio heros. *Say*, in Disseminator.
Unio undulatus. *Say*, Am. Conch. No. 2. *Deshayes.*
Unio heros. *Say*, Am. Conch. No. 6.

*undulatus. *Bar. Valen. Hild. Desh.*
Unio costata? *Raf.*
Unio costatus. *Con.*

*plicatus. *Lesueur. Say. Bar. Eat. Hild.*
Unio Peruviana. *Lam.*
Unio rariplicata. *Lam.*
Unio Dombeyanus. *Valen.*
Unio undulata. *Desh.*
Unio multiplicata. *Desh.*

*trapezoides. *Lea.*
Unio crassidens. *Lam. Var. a.*
Unio interruptus.§ *Say.*

TRIANGULAR.

*ambiguus. *Lea.*
Castalia ambigua. *Lam. D'Orb.*
Unio ambigua. *Blain. Desh. Sow.*
Mya ambigua. *Wood.*
Tetraplodon pectinatum. *Spix.*

NON-SYMPHYNOTE UNIONES.

PLICATE.

TRIANGULAR.

Cast. quadrilatera.‖ *D'Orb.*
Cast. inflata. *D'Orb.*

*foliatus.¶ *Hild.*
Unio flexuosa? *Raf.*
Unio flexuosus. *Con.*, in text, Monograph, page 8.
Unio foliatus. *Con.*, in plate 4, Monograph.

OVAL.

*pliciferus. *Lea.*

WIDE.

*multistriatus. *Lea. D'Orb.*
Diplodon ellipticum? *Spix.*

*subtentus. *Say. Con.*

*Conradicus. *Lea.*

*acutissimus. *Lea.*

*Murchisonianus. *Lea.*
Unio Douglasiæ. *Gray.*

*Grayanus. *Lea.*

ARCUATE.

ponderosus. *Lea.*
Mya ponderosa. *Solan. Dill.*
Mya crassa. *Wood.*

---

† This distinct and beautiful species was described from a single valve not entirely perfect. When the whole shall be found perfect, I think it likely to prove symphynote.

‡ When I described the *multiplicatus* in 1830, I had had several specimens for two or three years, and was not aware that Mr Say had published a shell under the name of *heros*, which he subsequently abandoned as the *undulatus* of Barnes; but in 1834 reclaimed as *heros*. I consider that Mr Say's abandonment of the species entitles me to it, if my previous claim be not sufficient.

§ Mr Say, in his "Synonymy," claims precedence in this species, although my Memoir bears date May 1830, while his is December 1831. (See Transylvania Journal, Vol. V.) The reader will not after this be surprised to be told that Mr Say does not allow me, in his very incorrect "Synonymy," to be the discoverer of *a single new species* of Unio from our western waters!! I may be allowed also to state, that I do not understand why he gives the same name to two of his different numbers: thus, he calls No. 17, *U. interruptus*, Rafin.; and No. 47, *U. interruptus*, Say. The species are evidently distinct.

‖ I owe to the kindness of M. D'Orbigny specimens of this and *inflata*. I regret, however, that I am compelled to differ in opinion with this distinguished naturalist, believing, as I do, that there has been as yet observed but one species of Lamarck's *Castalia*.

¶ The male of *foliatus* is certainly a triangular shell—the female differs in form very much, having a deep

NON-SYMPHYNOTE UNIONES.

NODULOUS.

QUADRATE.

- *lacrymosus.† *Lea.*

- *asperrimus.‡ *Lea.*
  - Unio quadrulus. *Say.*

- *fragosus.§ *Con.*

- Phillipsii. *Con.*

- *pustulatus. *Lea.*

- *Schoolcraftensis. *Lea.*
  - Unio prasinus. *Con.*

TRIANGULAR.

- *apiculatus. *Say.*

- *asper. *Lea.*

- *Dorfeuillianus. *Lea.*

- *stapes. *Lea.*

- *metanever. *Lea.*
  - Unio metanevra. *Raf.*
  - Unio nodosus. *Bar.*
  - Unio rugosus (Flat). *Bar.*
  - Unio metanevrus. *Con.*

NON-SYMPHYNOTE UNIONES.

NODULOUS.

TRIANGULAR.

- *cornutus. *Bar.*
  - Unio reflexa? *Raf.*
  - Unio reflexus. *Con.*

SUBROTUND.

- *pustulosus. *Lea.*
  - Unio verrucosus. *Bar. Var. b.*
  - Unio verrucosa. *Valen.*
  - Unio verrucosus albus. *Say;* but not of *Hildreth.*||

- *turgidus. *Lea.*
  - Unio Mortoni. *Con.*

- *Cooperianus. *Lea.*

- *verrucosus. *Bar. Eat.*
  - Unio tuberculata? *Raf.*
  - Unio tuberculosa. *Valen.*
  - Unio verrucosus purpureus. *Hild.*
  - Unio tuberculatus. *Con.*

- *graniferus. *Lea.*

- *nodulosus. *Lea.*
  - Mya nodulosa.¶ *Wood. Dill.*

- *irroratus. *Lea. Eaton.*
  - Unio verrucosus albus. *Hild.*

---

inflection on the posterior basal margin. It may be doubted if this should be considered a plicate shell. I consider that the folds of the growth, particularly in the male shells, require it to be placed here.

† It is a matter of some doubt if this be more than a beautiful variety of *asperrimus* (nobis). Future observation must determine. Ferussac and some other zoologists believe it to be distinct. Dr Ward says they "are certainly distinct."

‡ Mr Say supposed this to be the *rugosus*, Barnes. Two specimens referred to by Mr B. as *rugosus* were under my inspection, and proved to be—the one a flat *metanevra*, Rafin., the other a *plicatus* (Lesueur). Mr B. in his reclamation recognises his *rugosus* as *U. Peruviana*, Lam., which shell is undoubtedly the *plicatus*, (Lesueur and Say).

§ This shell has been considered the female of *asperrimus* (nobis), but I am, after the examination of many specimens, disposed to think it to be distinct. Some of our best western naturalists think it to be the true *rugosus* of Barnes.

|| A specimen sent to me by Dr Hildreth as *Unio verrucosus albus*, proved to be a true *irroratus* (nobis).

¶ This shell, as figured by Wood in his "General Conchology," seems to me to be distinct from the *pustulosus* (nobis), with which it has been confounded. The figure of Wood is longer than any *pustulosus* I have seen, and the epidermis is much darker ("bottle green"). The nodules are more numerous about the beaks, and the lateral tooth is longer and thicker. I doubt if the *nodulosus* be an American species.

NON-SYMPHYNOTE UNIONES.

NODULOUS.

SUBROTUND.
*dromas. *Lea.*

OBLIQUE.
*Æsopus. *Green.*
Unio cicatricosus. *Con.;* not of *Say.*
Unio varicosus. *Con.;* not of *Lea.*

*varicosus. *Lea.*
Unio cicatricosus? *Say.*†

*perplexus. *Lea.*
Unio gibbosus? *Raf.*
Unio gibbosus. *Con.*

WIDE.
*Leaii. *Gray.*

*granosus. *Brug. Lam.*

*tuberculatus. *Bar. Eat. Hild.*

Novæ Hollandiæ. *Gray.*

*cylindricus. *Say. Eat. Hild.*
Unio naviformis. *Lam. Blain. Valen.*

NON-SYMPHYNOTE UNIONES.

SPINOUS.

WIDE.
*spinosus. *Lea.*

SMOOTH.

QUADRATE.
*arcæformis. *Lea.*
Unio nexus.‡ *Say.*

TRIANGULAR.
*triangularis. *Bar. Eat. Hild. Say.*
Unio formosus.§ *Lea.* (Male.)
Unio cuneatus. *Swain.*

*elegans.‖ *Lea.*

*donaciformis.¶ *Lea.*

*zigzag. *Lea. Eat.*

*heterodon. *Lea.*

*penitus.†† *Con.*

*securis. *Lea. Eat.*
Unio depressa.‡‡ *Raf.;* but not of *Lam.*

---

† Never having seen the specimen described by Mr Say as *cicatricosus*, I am unable to decide if it be the same with *varicosus* (nobis). Two things mentioned by Mr Say induce me to doubt it. He calls his "a common species," and says it is "distinguishable by the single series of transverse elevations on the middle." The latter remark does not apply to *varicosus*, and I have always deemed it a rare shell.

‡ Say and Conrad both commit the error of giving precedence to *nexus*. My description of *arcæformis* is in my memoir, read before the American Philosophical Society May 20, 1831, while Mr Say's was first described in the Transylvania Journal of December 1831. Subsequently he republished it in his American Conchology, No. 6, where he places erroneously the date of 1832 to my memoir.

§ Mr Barnes's description of *triangularis* was made from a female shell, and mine of *formosus* from the male. There being an obvious distinction of the sexes in every specimen, my error was a very natural one, as we were not at the time acquainted with the sexual differences in the *Naïades*.

‖ Mr Say thinks that Mr Barnes's *undulatus*, Var. *a*, is the same with *elegans*. I think differently, and would fortify my opinion in the fact, that Mr B. does not mention the zigzag rays which are strikingly singular in the *elegans*, and could not have failed to have elicited his remarks had it been under his eyes.

¶ I have expressed my doubts, Transactions of the American Philosophical Society, Vol. IV., page 84, (page 94 in "Observations on the Genus Unio," &c.,) if this be more than a fine variety of *zigzag* (nobis). Mr Say gives it as a synonym to *nervosus*, Raf., and Mr Conrad as *truncata*, Raf.

†† I received from Judge Tait of Alabama, in 1830, several specimens of this species, but they were not sufficiently perfect to induce me to publish them. Mr Conrad does not mention the rays, a very peculiar character of which is their being dotted somewhat like those of *securis* (nobis), but in a lighter manner.

‡‡ Mr Conrad makes *depressa*, Raf., *ellipsaria*, Raf., and *securis* (nobis), synonymous with *lineolata*,

NON-SYMPHYNOTE UNIONES.

SMOOTH.

TRIANGULAR.

*camelus. *Lea.*

*ovatus. *Say. Lam. Bar. Valen. Eat. Hild. Con.*
Unio ventricosus. *Desh.*
Unio subovatus. *Desh.*
Unio occidens. *Desh.*

*subovatus.† *Lea.*

*crassidens.‡ *Lam.*
Unio cuneatus. *Bar. Eat. Hild.*
Unio niger? *Raf.*
Unio niger. *Con.*

*carbonarius. *Lea.*

*gibber. *Lea.*

*pumilis. *Lea.*

*rubiginosus. *Lea.*

*Barnesianus. *Lea.*

NON-SYMPHYNOTE UNIONES.

SMOOTH.

TRIANGULAR.

*pileus. *Lea.*

*Sowerbianus. *Lea.*

*trigonus. *Lea.*

*solidus. *Lea.*

*obliquus. *Lam.*
Unio undatus. *Bar.*
Unio trigonus.§ *Say* and *Con.;* not of *Lea.*
Unio mytiloides. *Eat.*
Unio undulatus. *Desh.*
Unio cordatus? *Raf.*
Unio cordatus. *Con.*

*pyramidatus. *Lea.*
Unio rubra? *Raf.*
Unio mytiloides. *Con.*

*mytiloides.‖ *Raf.*
Mya obliqua. *Wood.*

Raf. Mr Say does the same, with the exception of *ellipsaria*, which he considers distinct; while Mr Rafinesque himself places *lineolata* and *ellipsaria* in different subgenera!!

† Mr Say makes "*ventricosus*, Bar., *occidens* (nobis), *subovatus* (nobis), (var.), and *capax*, Green, (var.)," synonymous with *cardium*, Raf. In my opinion they form at least three, perhaps four distinct species.

‡ *Crassidens*, Var. *a*, Lam., is *trapezoides* (nobis).

§ Say and Conrad both give *trigonus* (nobis) as a synonym to *undatus*, Barnes. It is difficult for me to understand why they should not at once on comparison be recognised as different species. The *trigonus* is always more angular on the umbonial slope, and the undulations at the tips of the beaks differ. This may be observed particularly in the young and perfect specimens. If a doubt could be admitted as to the difference of the form of the shell, the colour of the animal in *trigonus* would at once settle the question. It is peculiar, and differs from all the species I know in being of so deep a colour as to be almost red.

Some years since, when I described this species, I deposited a specimen in the Academy of Natural Sciences of this city, with its proper name appended. Subsequently, I found the Academy had prefixed the name of *undatus*, Barnes, to the label, and I presume this error is still continued there.

‖ It is a matter of great doubt if this name ought to be admitted at all in this table. It was applied many years since, by the naturalists of this city, without reference to any particular specimen, but, as it now appears nearly certain, incorrectly. Dr Ward says the description and outline would "equally well apply to six or eight different species." The difficulty of recognising Mr Rafinesque's species is well illustrated in this one. Mr Conrad considers *triangularis*, Raf., as the type, and gives the following names of the same author as synonyms, viz. *lateralis*, *sintoxia*, *pachostea*, *mytiloides*, and *rubra*; thus charging him with making six species of one. But what is still more extraordinary, this single species, (agreeably to Mr Conrad's synonyms) is not only divided by Mr R. into *different subgenera*, but into *different genera*, and even into two DIFFERENT SUB-

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OBLIQUE.

*Troostensis. *Lea.*
Unio trabalis. *Con.*

*Tigris. *Fer.*

*Taitianus. *Lea.*

cor. *Con.*

truncatus. *Swain.*

*decisus. *Lea. Con.*

*clavus. *Lam. Con.*
Unio scalenia. *Raf.*
Unio modioliformis. *Say;* not of *Lea.*

*patulus. *Lea.*

*Ravenelianus.† *Lea.*

*Rangianus. *Lea.*

*sulcatus. *Lea. Eat. Say.*
Unio ridibundus. *Say. Eat.* (Female.)‡

*Haysianus. *Lea.*

*ellipsis.§ *Lea. Eat.*
Unio brevialis? *Sow.*

*castaneus. *Lea.*

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

*Tampicoensis. *Lea.*

*Lecontianus. *Lea.*

*perdix. *Lea.*

pectorosus. *Con.*

*ventricosus. *Bar.*

*occidens.‖ *Lea.*
Unio ventricosus. *Say.*

*dolabræformis. *Lea.*

*globosus. *Lea.*
Sym. globosa. *Lea,* Trans. Am. P. S.
Unio capax? *Green.*

*splendidus. *Lea.*

*ochraceus. *Say. Con.*
Sym. ochracea. *Lea.* Trans. Am. P. S.

*cariosus. *Say. Bar.*
Unio cariosa.¶ *Lam.*
Unio ovata. *Valen.*
Unio luteola. *Con.;* not of *Lam.*

FAMILIES!! See "New Fresh Water Shells of the United States," p. 72, and Mr Rafinesque's "Monographie." In Mr Say's "Synonymy," *triangularis*, Raf., is considered to be the same as *ellipsis* (nobis)!

† Mr Conrad has subsequently published a different species under this name.

‡ For some years I was satisfied that Mr Say's *ridibundus* was only a variety of *sulcatus* (nobis). There can now, however, scarcely be a doubt that it is the female of that species; but it must be remarked, that this serrated shell is usually found smaller than the other; a circumstance not common with the females of other species. Mr S. describes and figures *ridibundus* in No. 1 of "American Conchology," but does not insert it in his "Synonymy" in No. 6.

§ Mr Say in his "American Conchology," refigures this, and recognises my name. Subsequently, in his "Synonymy," he makes it a synonym of *triangularis*, Raf. Mr Conrad says it is *olivarius*, Raf.

‖ This and the preceding shell are so nearly allied, that it is a matter of doubt with me if it would not be preferable to unite them. Dr Ward thinks they are male and female. Subsequent examination may throw sufficient light upon them to decide with certainty. Among Mr Barnes's varieties of *ventricosus*, it is evident there are several distinct species.

¶ *U. cariosa*, Lam. (Var. 2,) is the Alas. *marginata*, Say.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

perovatus. *Con.*

altilis. *Con.*

*multiradiatus. *Lea.*
- Unio fasciola? *Raf.*
- Unio fasciolus. *Con.*
- Unio ligamentina. *Desh.*

*Novi-Eboraci. *Lea.*

perovalis. *Con.*

*capsæformis. *Lea.*

Greenii. *Con.*

*pictus. *Lea.*

tæniatus. *Con.*

*interruptus. *Lea.*

*Menkianus. *Lea.*

*venustus. *Lea.*

*crassus. *Say. Bar.*†
- Unio ellipticus. *Bar.*
- Unio carinatus. *Bar.*
- Unio ligamentina. *Lam.*

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

- Mya gravis. *Wood.*
- Unio fasciatus. *Con.*‡

*orbiculatus. *Hild.*
- Unio abruptus.§ *Say.*
- Unio crassus. *Con.*

australis. *Lam.*

*Hydianus. *Lea.*

*Clairbornensis. *Lea.*

*luteolus. *Lam.*
- Unio siliquoideus.‖ *Bar. Con.*
- Unio inflatus. *Bar.*

Childreni.¶ *Gray.*

pulcher. *Lea.*

*radiatus. *Lam. Bar. Hild.*
- Unio Virginiana. *Lam.*
- Mya radiata. *Gmel. Wood. Dill.*
- Mya oblongata. *Wood.*
- Mya pictorum tenuis. *Chem.*

*Medellinus. *Lea.*

*notatus. *Lea.*

*Vanuxemensis. *Lea.*

---

† Mr Barnes made eleven varieties of *crassus;* most of which were no doubt distinct species, some were plicate.

‡ Mr Conrad thinks the *crassus* of Say is *fasciata* of Mr Rafinesque. An examination of his description ought to satisfy any one that the *crassus* of Say could not have been under the eye of the author when he made his description of *fasciata.*

§ The specimen figured by Mr Say in Amer. Conch. No. 2, is a female shell. The male shell is not abrupt at the posterior margin.

‖ Mr Say makes *siliquoideus* the same with *viridis,* Raf. Ferussac, in his cabinet, makes it the same with *fasciata,* Raf. Mr Conrad makes it the same with *vittata,* Raf. Ferussac, in his "Observations," states the inextricable difficulty resulting from the confusion caused by Mr Rafinesque. See "Observations," p. 13, in Magazin de Zoologie.

¶ I have never seen this species, but presume, from the figure in Griffith's Cuvier, very poor as it evidently is, that it is a distinct species.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

*Nashvillianus. *Lea.*

*Zeiglerianus. *Lea.*

lienosus. *Con.*

*obscurus. *Lea.*

*delodontus. *Lam.*
  Unio lacteolus. *Lea. D'Orb.*

*charruanus.† *D'Orb.*

*lamellatus. *Lea.*

*Bengalensis. *Lea.*

*cœruleus. *Lea. Ben.*

*olivarius. *Lea. Ben.*

*Batavus. *Lam. Pfeif. Flem.*
  Mya pictorum. *Chem. Schröeter. Monta.*
  Mya ovalis.‡ *Soland.*
  Mya Batava. *Wood. Maton. Dill.*
  Mysca Batava. *Turton.*
  Unio riparia. *Pfeif.*
  Unio pictorum. *Drap.*, pl. 11, fig. 3.
  Unio fusculus. *Mühl.*
  Unio gibba. *Mühl. Pfeif.*
  Unio Labacencis. *Mühl.*
  Unio reniformis. *Schmidt.*
  Unio fuscus. *Zeig.*
  Unio consentaneus. *Zeig.*
  Unio amnicus. *Zeig.*
  Unio carynthiacus? *Zeig.*
  Unio decurvatus. *Rossmaesler.*
  Unio sinuatus. *Stud.*
  Unio planus. *Stud.*
  Unio ater.§ *Nil.*

*Cumberlandianus. *Lea.*

Smithii.‖ *Gray.*

vibex. *Con.*

*Mühlfeldianus. *Lea.*

*creperus. *Lea.*

*glaber. *Lea.*

*Hildrethianus.¶ *Lea.*
  Al. ambigua? *Say.*

*fabalis.†† *Lea.*

---

† The two specimens sent to me by M. D'Orbigny are so like *delodontus*, that I am strongly induced to believe that they will prove to be the young of that species.

‡ On the authority of Dillwyn.

§ On the authority of Ferussac.

‖ Never having seen this shell, I place it here on the authority of Mr Gray.—See his figure in Griffith's Cuvier, Vol. XII.

¶ I retain this species among the *Uniones*, although it does not possess a perfect lateral tooth. As it is, however, thickened along the dorsal margin, and puts on the appearance of a tooth, I have concluded that it was better not to remove it to the Sub. Gen. *Margaritana*, to which it has little resemblance in its general characters. These observations may apply to *U. oriens* (nobis), and partially to *U. monodonta*, Say, (*U. soleniformis*, nobis.) Mr Say's description of *ambigua* answers well to *Hildrethianus*, but I am not sure it is the same, as he has given no figure of it. He seems to have abandoned it, as he does not insert it in his "Synonymy." Mr Conrad also avoids the insertion of it in his Synoptical Table.

†† Say and Conrad both in their catalogues give precedence to *lapillus*. *Fabalis* is in my Memoir read before the Am. Philos. Soc., May 7, 1830, and inserted in the Transactions; *capillus* was first inserted in the

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

Unio capillus. *Say*, Transylvania Journal, Vol. V.
U. lapillus. *Say*, Am. Conch. No. 5, *Con.*

*parvus. *Bar. Eat.*
Unio parvus. *Con.*

*glans.[†] *Lea.*

*divaricatus. *Lea.*

*faba. *D'Orb.*

*Burroughianus. *Lea. D'Orb.*

*discus. *Lea.*

*simus. *Lea.*

*corrugatus. *Lam.*
Mya corrugata. *Müller. Chem. Gmel. Wood. Dill.*
Mya rugosa. *Gmel. Wood. Dill.*

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

Mya nodosa? *Gmel. Wood. Dill.*
Mya spuria. *Gmel.? Wood.*
Unio spuria. *Lam.*
Unio triradiata. *In "Museum" at Paris.*

*Niloticus. *Fer. Caill.*
Mya pictorum. *Forkaël.*[‡]

*Egyptiacus.[§] *Caill. Fer.*

OBLONG.

*brevidens. *Lea.*

tetralasmus. *Say.*

*camptodon.[||] *Say.*
Unio declivis.[¶] *Con.*

*obesus.[††] *Lea.*

*Hopetonensis. *Lea.*

*Roanokensis. *Lea.*

December number (1831) of the Transylvania Journal, and subsequently in the "Amer. Conch." No. 5, (Aug. 1832) under the name of *lapillus*. Mr Say does not mention why he changed the name on redescription. I should prefer the first, as a more descriptive name, were I to choose between the two.

[†] Mr Say doubts if the *glans* be not the same with *parvus*. I do not see how there can be any difficulty in distinguishing them. The *glans* is a much heavier shell, and the nacre of all the specimens I have seen is more or less purple, while that of *parvus* is always, I believe, white. Among many hundred specimens which have come under my notice, I have never seen one of any other colour. The texture of the nacre is also totally different, the latter being more pearly than any other of our *Uniones*. In the epidermis and beaks they also differ essentially.

[‡] On the authority of Ferussac.

[§] The specimen of this species which I received from M. Caillaud, the traveller, is so much like *Niloticus*, that I certainly would not myself have separated it.

[||] This fine shell, as well as the preceding one, both of which are Mr Say's, seem to have been overlooked in the formation of his catalogue. They are described in his Amer. Conchology. I have never seen the shell he calls *tetralasmus*,—they may possibly prove to be the same.

[¶] The shell in the Academy of Nat. Sci., described and figured by Mr Conrad in his "Monography," page 45, as *declivis*, Say, I consider to be a middle aged *camptodon*, Say. This, however, is not the opinion of all our conchologists.

[††] Ferussac believes that this is *Carolinianus* of Bosc. Not having seen the specimen described by Bosc, nor having access to his description, I am unable to decide. The fact, however, of Bosc's having visited Carolina some forty years since, renders it highly probable to be so. Ferussac gives his *trapezium* as a synonym to *Carolinianus*. In my table of the Uniones made in 1829, I considered *Carolinianus* as the *complanatus*: in which I was most likely wrong.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OBLONG.

*jejunus. Lea.

*complanatus. *Lea.*
Mya complanata. *Soland. Dill.*
Unio violaceus.† *Spangler.*
Unio purpureus.‡ *Say. Bar.*
Unio rarisulcata. *Lam.*
Unio coarctata. *Lam.*
Unio purpurascens. *Lam.*
Unio rhombula. *Lam.*
Unio carinifera. *Lam.*
Unio Georgina. *Lam.*
Unio glabrata. *Lam.*
Unio sulcidens. *Lam.*
Unio fluviatilis. *Green.*
Mya rigida? *Wood.*

*Griffithianus. *Lea.*

*auratus. *Lea.*
Niäa aurata. *Swain.*
Unio obtusa.§ *Fer.*
Unio depressus.§ *Less.*

*atratus. *Lea.*
Niäa atrata. *Swain.*
Niäa fragilis. *Swain.*

*confertus. *Lea.*

*paliatus. *Ravenel's Letter.*

Watereensis. *Lea.*
Unio Raveneli.‖ *Con.*

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OBLONG.

*fulvus. *Lea*
Unio icterinus. *Con.*

*Congaræus. *Lea.*

*declivis. *Say.*
Unio geometricus.¶ *Lea.*

*Blandingianus. *Lea.*

*depressus. *Lam. D'Orb.*

angustus. *Lam.*

*modestus. *Fer.*

*litoralis. *Lam. Pfeif. Des Moul. Grat.*
Unio crassus. *Schr. Retz. Neil. Speng.*
Unio rhomboidea. *Schr.*
Unio brevialis. *Lam.*
Unio semirugata. *Lam.*
Unio nana. *Lam.*
Unio subtetragona. *Mich.*
Unio incurvus. *Lea.*
Unio Pianensis. *Farines.*
Unio granosus. *Schum.*
Mysca ovata. *Turt.*
Mya depressa. *Don.*

SUBROTUND.

*circulus. *Lea. Eat.*
Mya rotunda? *Wood.*

*lens.†† *Lea.*

---

† On the authority of Ferussac.

‡ Mr Conrad is wrong in his "Synoptical Table," in giving Mr Say's name precedence, making *complanatus* a synonym.

§ On the authority of D'Orbigny.

‖ Prof. Ravenel's name being previously used for a *Unio* (Amer. Phil. Soc. Trans., Vol. V.), it becomes necessary to change Mr Conrad's name, which I do, to that of the river in which it was found.

¶ I do not find either of these names in Mr Say's Synonymy. He has, however, priority.

†† I have some doubts whether this should be considered more than a variety of *circulus.* I am not, however, sure, that it is not distinct.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

SUBROTUND.

rubellus. *Con.*

Masoni. *Con.*

*rotundatus. *Lam.*
Unio suborbiculata. *Lam.* *Blain.*
Unio glebulus.† *Say.*
Unio subglobosus. *Lea.*

*Paranensis. *Lea.* *D'Orb.*
Unio Solisiana. *D'Orb.*

membranacea.‡ *Lea.*
Myt. membranacea. *Mat.*
Myt. Matoniana. *D'Orb.*

variabilis. *Lea.*
Mya variabilis.§ *Mat.* *Wood.* *Dill.*
Unio rotundus. *Wag.*

*personatus. *Say.*
Unio capillaris. *Lea.*

*retusus. *Lam.* *Con.*
Unio torsa. *Raf.* *Eat.*

*ebenus. *Lea.*
Unio mytiloides. *Con.*; not *Raf.*

maculatus. *Con.*

NON-SYMPHYNOTE UNIONES.

SMOOTH.

SUBROTUND.

*Kirklandianus. *Lea.*

*subrotundus. *Lea.*
Unio politus? *Say.*
Unio brevialis? *Crouch.*

infucatus. *Con.*

*coccineus. *Lea.*
Unio coccineus. *Dr Hildreth's Letter.*
Unio coccineus. *Con.*
Unio catillus. *Con.*

WIDE.

*Shepardianus. *Lea.*

*folliculatus. *Lea.*

*rectus. *Lam.* *Eat.*
Unio prælongus. *Barn.* *Hild.*
Unio recta. *Valen.*
Unio Sageri?‖ *Con.*
Mya prælonga. *Wood.*

*dehiscens.¶ *Say.*
Unio oriens. *Lea.*

*angustatus. *Lea.*

---

† Although Mr Say had published this shell in the Transylvania Journal, and in his Am. Conchology, he omitted it altogether in his "Synonymy." Other species are inserted from the vicinity of New Orleans.

‡ I formerly placed this with the Anodontæ, but D'Orbigny, who has seen the shell in its native waters, having placed it among the *Uniones*, I follow him, never myself having seen the shell. The figure of Dr Maton (Linn. Trans. Vol. X) is without teeth, and the text says expressly "cardo edentulus." Notwithstanding this, I am inclined to believe that D'Orbigny is right, for the form of the shell is such as I have not seen in the Anodontæ. Not knowing what induced M. D'Orbigny to change Dr Maton's name, I have restored it.

§ The figure of this shell in the Lin. Soc. Trans., Vol. X., although so much smaller a shell than *Paranensis* (nobis), is so much like it, that I should not be surprised if they should prove to be the same.

‖ Mr Conrad's figure so nearly resembles the male specimens of *U. rectus*, from Green Bay, in my cabinet, that I am persuaded the *Sageri* will not prove to be a distinct species. Drs Kirtland and Ward, and Judge Tappan, consider it a variety of *gibbosus* of Barnes.

¶ Mr Say gives Mr Rafinesque's name of *lata* precedence. Mr Eaton says that *An. lata*, Raf., is *Sym. tenuissima*, Lea.

NON-SYMPHYNOTE UNIONES.
SMOOTH.
WIDE.

*lanceolatus.† *Lea.*

*Anodontoides. *Lea.*
  Unio teres? *Raf.*
  Unio teres. *Con.*

*parallelopipedon. *Lea. D'Orb.*

*platyrhynchus.‡ *Rossmaesler.*

*Cailliaudii. *Fer.*

*ovalis. *Flem. Sow.*
  Mytilus angustior.§ *List.*
  Mya ovalis. *Monta.*
  Mya ovata. *Don. Mat. Wood. Dill.*
  Mya depressa. *Don.*
  Mysca solida. *Turt.*
  Unio nodulosa. *Lam.*
  Unio tumida. *Retz. Pfeif. Nil.*
  Unio Michaudiana? *Des Moul.*
  Unio ovata. *Bouil.*
  Unio rostrata. *Stud.*
  Unio Limagnæ. *Bouil.*

*pictorum. *Lam. Pfeif. Drap. Blain. Crouch. Flem. Des Moul. Grat. Bouil.*
  Mya pictorum. *Lin. Poli. Dill. Wood. Mat.*
  Mya corrugata Maroccana.‖ *Chem.*
  Long thick horse mussel. *Petiv.*

NON-SYMPHYNOTE UNIONES.
SMOOTH.
WIDE.

  Mya angustata. *Schrœt. Klein.*
  Mysca pictorum. *Turt.*
  Unio rostrata. *Lam. Pfeif. Mich. Desh. Bouil.*
  Unio manca. *Lam.*
  Unio elongatula. *Mühl.*
  Unio Turtonii. *Payraud.*
  Unio Capigliolo. *Payraud.*
  Unio Requienii. *Mich.*
  Unio Deshayesii. *Mich.*
  Unio limosa. *Nil.*
  Unio longirostris. *Zeigl.*
  Unio Limovianscæ. *Fer.*

*elongatus. *Pfeif.*

productus. *Con.*

*nasutus. *Say. Barn. Swain.*
  Unio rostratus. *Valen.*
  Mya nasuta. *Wood.*
  Unio subrostratus? *Say.*

*Fisherianus. *Lea.*

*Jayensis. *Lea.*

*lugubris. *Lea.*

*marginalis. *Lam.*
  Unio anodontina. *Lam.*

---

† M. Deshayes (2d edit. Lamarck) doubts if *lanceolatus* be not the young of *Anodontoides*. The first has been found only in the waters east of the Alleghany mountains, the last only in the western waters. There cannot be a doubt of their being distinct species. In size they differ altogether.

‡ This is a curious and very interesting new species which I recently received from Vienna. Its habitat is Carynthia.

§ On the authority of Fleming.

‖ Chemnitz figures this shell, Vol. VI. table 3, fig. 23 & 24. From the description and outline, I have little doubt of its being a young *pictorum*, more than usually undulated in the region of the beaks. Its being rugose over the whole surface, as mentioned by him, is not evidence against its being such. As the first growth subsequently forms the beak of the shell, it ought of course to be rugose, if that be the character of the shell. The inside view is without teeth, but this is doubtless the fault of the draftsman or engraver, as the author speaks of the hinge being like the common mussel.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

WIDE.

- *iris.† *Lea.*
  - Unio nebulosus. *Con.*
- *tenuissimus. *Lea.*
  - Symp. tenuissima. *Lea,* in Trans. Am. P. S.
  - An. purpurascens. *Swain.*
  - Unio velum. *Say.*
- *bilineatus. *Lea. Ben.*
  - Symp. bilineata. *Lea,* in Trans. Am. P. S.
- *Corrianus. *Lea.*
- *phaseolus. *Hild. Eat.*
  - Unio planulatus. *Lea.*
  - Unio cuneatus.‡ *Barn.* (White var.)
- arcus. *Con.*
- arctatus. *Con.*
- *gibbosus. *Bar. Eat. Hild.*
  - Unio mucronatus. *Bar.*
  - Unio nasuta. *Lam.*
  - Unio dilatata? *Raf.*
  - Unio dilatatus. *Con.*
- *arctior. *Lea.*
- *Patagonicus. *D'Orb.*

NON-SYMPHYNOTE UNIONES.

SMOOTH.

WIDE.

- *Vaughanianus. *Lea.*
  - Unio Carolinensis. *Prof. Ravenel's Letter.*

OBOVATE.

- *purpuratus. *Lam.*
  - Mya ventricosa.§ *Solan. Humphreys?*
  - Unio ater. *Lea.*
  - Unio lugubris. *Say.*
  - Unio Poulsoni. *Con.*
- rhombeus. *Wag.*
  - Diplodon rhombeum. *Spix.*
- *cuprinus. *Lea.*
  - Unio metallicus.‖ *Say.*
- *modioliformis. *Lea.*
  - Unio delumbis. *Con.*
- *tenerus. *Rav.*
  - Unio tenebrosus. *Con.*
- *Tappanianus. *Lea.*
- *contradens. *Lea.*
- stramineus. *Con.*

---

† Mr Say in his "Synonymy" gives *iris* as a synonym to his *subrostratus.* If they were the same I would be entitled to precedence, as my description bears date March 1829, while his is January 1831. His description, however, of *subrostratus* does not apply to my *iris,* and certainly this shell could not have been under his eye when his description was made. He says that the *subrostratus* "may be said to be the analogue of the *Unio nasutus* (nobis) of the western waters." As the *U. nasutus* inhabits the western waters, a variety of that species may have been described by him for *subrostratus.*

‡ In note to Dr Hildreth's Memoir on the shells in the vicinity of Marietta, Ohio, published in Silliman's Journal.

§ On the authority of Ferussac.

‖ Mr Say in his "Synonymy" claims precedence. My Memoir bears the date of May 7, 1830; his that of January 1, 1831.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

ARCUATE.

*crassissimus. *Fer.* *Des Moul.* *Grat.*
Mya crassissima.† *Klein.*
Unio auricularis.† *Speng.*
Unio margaritacea. *Drap.*
Unio sinuata. *Lam.* *Blain.* *Pfeif.* *Desh.*
Unio rugosa.† *Poir. ?*

*monodontus. *Say.* *Eat.*
Unio soleniformis. *Lea.*

*emarginatus. *Lea.*

Being unacquainted with the following species, I have deemed it best simply to insert a list of them, with the hope of their being determined at a future period:—

Unio rubens. *Menke.*
Unio rugatus. *Menke.*
Unio Grœnlandicus.† *Schrö.* *Fer.*
Unio orientalis. *Fer.*
Unio nitidens. *Fer.*
Unio obtusus. *Fer.*
Unio preciosus. *Fer.*
Unio pulchellus. *Fer.*
Unio purpuriatus. *Say.*
Unio musivus.† *Speng.*
Unio gibbus.† *Speng.*
Unio truncatus.† *Speng.*
Unio oviformis. *Con.*
Unio furvus. *Con.*
Unio Juliani. *Rang.*
Unio psammoica. *D'Orb.*
Unio rhuacoica. *D'Orb.*
Unio Fontainiana. *D'Orb.*
Unio hylœa. *D'Orb.*
Unio Guaraniana. *D'Orb.*

The following species are supposed to exist in a fossil state. As the casts only are usually observed, it must be a matter of great doubt as to the propriety of making species where that is the case:—

Unio crassiusculus. *Sow.* *Flem.*
Unio concinnus. *Sow.* *Flem.*
Unio uniformis. *Sow.* *Flem.*
Unio acutus. *Sow.* *Flem.*
Unio Listeri. *Sow.* *Flem.*
Unio Solandri. *Sow.* *Flem.*
Unio porrectus. *Sow.*
Unio compressus. *Sow.*
Unio antiquus. *Sow.*
Unio aduncus. *Sow.*
Unio cordiformis. *Sow.*
Unio crassissimus.‡ *Sow.* *Flem.*
Unio subconstrictus. *Sow.* *Flem.*
Unio hybridus. *Sow.* *Flem.*
Unio Urii. *Flem.*
Unio abductus. *Phil.*
Unio peregrinus. *Phil.*
Unio petrosus. *Mort.*
Unio tumulatis. *Mort.*
Unio terrenus. *Mort.*
Unio saxulum. *Mort.*

II. SUBGENUS MARGARITANA.§

SYMPH. MARG.

PLICATE.

TRIANGULAR.

*complanata. *Lea.*
Alas. complanata. *Bar.* *Hild.*
Symp. complanata. *Lea,* Trans. Am. P. S.

---

† On the authority of Ferussac.

‡ This name is pre-occupied by Ferussac.

§ The genus *Margaritana* was proposed by Shumacher in his "Essai d'un Nouveau Système des Habitations des Vers Testacés," published in 1817, for the *Mya margaritifera*, Lin. (*Unio elongata*, Lam. and *Alasmodonta arcuata*, Bar.) Mr Say, in 1818, proposed to establish this same division under the generic name of *Alasmodonta*. The Danish zoologist having priority of date must have his name preferred, unless, as Mr Gray thinks, Leach's name of *Damalis* has priority of both. Unfortunately, I have not the means of referring to his description.

NON-SYMPHYNOTE MARGARITANÆ.

PLICATE.

QUADRATE.

- *confragosa. *Lea.*
  - Alas. confragosa. *Say.*

TRIANGULAR.

- *arcula. *Lea.*

OBLONG.

- *marginata. *Lea.*
  - Alas. marginata. *Say. Bar.*
  - Alas. truncata.† *Say.*
  - Unio cariosa. (Var. 2.) *Lam.*
  - Unio varicosa. *Lam.*
  - Unio calceolus. *Say*, not of *Lea.*
  - Mya regulosa. *Wood.*
- *rugosa. *Lea.*
  - Alas. rugosa. *Bar. Eat. Hild.*
  - Alas. abducta. *Say.*

SMOOTH.

TRIANGULAR.

- *deltoidea. *Lea.*
- *undulata. *Lea.*
  - Alas. undulata. *Say. Bar.*
  - Alas. sculptilis (young). *Say.*

NON-SYMPHYNOTE MARGARITANÆ.

SMOOTH.

TRIANGULAR.

- Mya undulata. *Wood.*
- Unio hians. *Valen.*
- Unio glabratus. *Sow.*

OVAL.

- *Raveneliana. *Lea.*
- radiata.‡ *Lea.*
  - Alas. radiata. *Con.*
- *calceola.§ *Lea.*
  - Unio calceolus. *Lea*, Trans. Am. P. S.
  - Alas. marginata.|| *Say.*
  - Alas. truncata. *Con.*, not of *Say.*

OBOVATE.

- *Bonellii. *Lea.*
  - Alas. Bonellii. *Fer.*
  - Unio depressa. *Pfeif. Mühl.*
  - Unio compressa. *Menke.*
- *Paraguayana. *Lea.*
  - Monocondylœa. Paraguayana.¶ *D'Orb.*

---

† Several specimens of fine *marginata* have been sent to me from the west, marked *Alas. truncata*, Say, being one of his unpublished names, but given by him to various conchologists under that name. I have never considered it distinct from the *marginata* of the eastern rivers, although it is generally larger and of finer colour in the exterior.

‡ This shell, in the teeth, except in the size of them, very closely resembles the *An. areolatus*, Swain. which Mr Say described as *Alas. edentula*. Although in both these shells there is a small cardinal tooth, in all their other characters they so closely resemble the *Anodontæ*, that it is a matter of doubt with me as to the propriety of separating them. An examination of the animals, when satisfactorily dissected, may show the necessity of placing them both, notwithstanding their possessing small teeth, with the *Anodontæ.*

§ In my Memoir in the Trans. Am. Phil. Soc., Vol. III. page 420, (page 34 of "Observations on the Genus Unio,") I mention this shell as being closely allied to the genus *Alasmodonta* of Say. In this Synopsis I have deemed it better to transfer it to the subgenus *Margaritana*, as the lateral tooth is observable in very few individuals. Deshayes says it is between *Unio* and *Alasmodonta.*

|| Mr Say in his "Synonymy" makes *calceolus* and *Alas. marginata* the same. I am surprised at this, as their characters, in many respects, are very different, and I have never heard it even suggested before that they could be confounded.

¶ D'Orbigny, the distinguished traveller in South America, forms the genus *Monocondylœa* for a group of shells which he has first observed, and which possess a single cardinal tooth. This tooth certainly differs from that of the *Margaritana fluviatilis*, Schum., *Alasmodonta*, Say; but for the present, at least, I prefer placing them in Schumacher's genus. The possession of one cardinal tooth, and the absence of a lateral one, is the distinguishing character of both of them. I am indebted to the great kindness of M. D'Orbigny for the first five—

NON-SYMPHYNOTE MARGARITANÆ.

SMOOTH.

OBOVATE.

*Parchappii. *Lea.*
Monoc. Parchappii. *D'Orb.*

*Corrientesensis. *Lea.*
Monoc. Corrientesensis. *D'Orb.*

*Guarayana. *Lea.*
Monoc. Guarayana. *D'Orb.*

*fossiculifera. *Lea.*
Monoc. fossiculifera. *D'Orb.*

Minuana. *Lea.*
Monoc. Minuana. *D'Orb.*

ARCUATE.

*margaritifera. *Lea.*
Mya margaritifera. *Lin.* *Chem.* *Knorr.* *Dill.* *Desh.* *Wood.* *Mat.* *Monta.* *Mühl.* *Retz.* *Nil.*
Margaritana fluviatilis. *Schum.*
Unio elongata. *Lam.* *Mich.* *Bouil.*
Unio sinuata. *Pfeif.*
Unio Roissyi. *Mich.*
Unio margaritiferus. *Pfeif.* *Drap.* *Turt.*
Unio rivalis. *Zeig.*
Alas. margaritiferum. *Flem.*
Alas. arcuata. *Bar.*

*Holstonia. *Lea.*

*fabula. *Lea.*

The following species are unknown to me :—
Alasmodonta Tripolitana. *Fer.*
Alasmodonta incurva. *Fer.*

III. SUBGENUS DIPSAS.

SYMPHYNOTE DIPSADES.

PLICATE.

TRIANGULAR.

*plicatus.† *Leach.*
Barbata plicata.‡ *Humph.*
Myt. plicatus. *Soland.*
Myt. dubius. *Gmel.* *Dill.*
Cristaria tuberculata. *Schum.*
An. dipsas. *Blain.* *Fer.*
An. tuberculatus. *Fer.*
An. alatus. *Sow.*
Symph. bi-alata. *Lea,* Trans. Am. P. S.
Unio bi-alata. *Desh.*

SMOOTH.

OVAL.

*discoideus.§ *Lea.*
Symp. discoidea. *Lea,* Trans. Am. P. S.
Unio tenuis. *Gray.*||
An. tenuis. *Gray.*||

---

the sixth one I place here with some hesitation, as to its proper situation, never having seen it. It is certainly a most interesting group, and it is to be regretted that we have no description of the animal.

† Perfect specimens show the whole linear tooth, and the folds on the posterior slope and on the posterior wing, but old and imperfect specimens sometimes exhibit neither. The imperfect figure and description by Leach of this fine shell, led me to believe that it could not be the same with that which I described under the name of *Sym. bi-alata.*

‡ On the authority of Gray.

§ The posterior termination of the tooth shows some disposition to duplication, and evidently inclines to pass into the subgenus *Unio.*

|| In Griffith's Cuvier.

IV. SUBGENUS ANODONTA.

SYMPHYNOTE ANODONTÆ.

SMOOTH.

TRIANGULAR.

*Wahlamatensis. _Lea._

OVAL.

*magnifica. _Lea._
Symp. magnifica. _Lea,_ Trans. Am. P. S.

*Woodiana. _Lea._
Symp. Woodiana. _Lea,_ Trans. Am. P. S.

*Benedictensis. _Lea._
Symp. Benedictensis. _Lea,_ Trans. Am. P. S.

*Nuttalliana. _Lea._

NON-SYMPH. ANODONTÆ.

PLICATE.

OBOVATE.

*crispata. _Lam._

SMOOTH.

OVAL.

*cygnea.† _Drap. Lam. Crouch. Blain. Pfeif. Turt. Des Moul. Flem. Grat. Bouil._
Myt. cygneus. _Gmel. Chem. Schrö. Dill. Mühl. Monta. Mat._‡ _Shep. Tur._
Myt. anatinus. _Gmel. Chem. Schrö._

NON-SYMPHYNOTE ANODONTÆ.

SMOOTH.

OVAL.

Schum. Wood. Monta. Tur. Dill. Mat.
Myt. stagnalis. _Gmel. Bosc. Dill. Sow._
Myt. fluviatilis.§ _Gmel._
Myt. fucatus. _Dill._
Myt. Zellensis. _Gmel. Schrö. Bosc._
Myt. Avonensis. _Monta. Wood. Ed. Encyclopœdia._
Myt. radiatus.‖ _Mühl. Schrö._
Myt. incrassatus. _Shep._
Myt. macula. _Shep._
An. anatina. _Lam. Dill. Drap. Sow. Pfeif. Flem. Grat. Des Moul. Bouil._
An. sulcata. _Lam._
An. dentiens. _Menke._
An. intermedia. _Lam. Pfeif. Bouil._
An. variabilis. (Var. b.) _Drap._
An. cellensis. _Pfeif._
An. ventricosa. _Pfeif._
An. ponderosa.¶ _Pfeif._
An. paludosus. _Tur._
An. grossa. _Zeig._
An. compressa ?†† _Zeig._
An. obvoluta ?†† _Zeig._
An. spuria. _Count Yoldi's Letter._
An. proboscidalis. _Zeig._
An. piscinalis. _Nil._

---

† I have, after a good deal of consideration and examination of my specimens, and the figures in the numerous works describing the _Naïades_, satisfied myself that _An. cygnea_ and _An. anatina_ are not specifically distinct. If the observation of M. Poiret, that the first is viviparous and the last oviparous, be correct, then they should be certainly separated. I feel perfectly persuaded, however, that he must be in error. Turton, in his recent work on the Land and Fresh Water Shells of Great Britain, says he is "inclined to think that all our supposed species of this genus may be justly resolved into one."

‡ _β_ of Maton and Racket (Lin. Soc. Trans., Vol. IV.) is evidently, judging from the figure, _Unio litoralis._

§ Gmelin states this shell to be from the fresh waters of Europe, and allied to _Anatina._ If this be true, there cannot be a doubt of its being the same with _cygnea._ The _fluviatilis_ of Solander and Dillwyn is said to be from North America, and is no doubt the _cataracta_ of Say.

‖ On the authority of Dillwyn.

¶ This and the _grossa_ are certainly very different in aspect from the _cygnea_, Lam., being more ponderous and less produced behind. This difference may, however, be effected by locality. Should it prove constant, _ponderosa_ ought to be considered a distinct species, and I am much disposed to think that such will prove to be the fact.

†† On the authority of Ferussac.

NON-SYMPHYNOTE ANODONTÆ.

SMOOTH.

OVAL.

Anodontites cygnea.† *Poir.*
Anodontites anatina. *Poir.*

*Oregonensis. *Lea.*

*Pepiniana. *Lea.*

*fragilis. *Lam.*

uniopsis. *Lam.*

Chaiziana.‡ *Rang.*

*undulata. *Say.*
Anodon rugosus. *Swain.*
Anodonta Pennsylvanica. *Lam.*

*Wardiana. *Lea.*
A. virgata. *Con.*

*edentula. *Lea.*
Alas. edentula. *Say.*
Anodon. areolatus. *Swain.* *Coop.*

*pavonia. *Lea.*

*limnoica. *D'Orb.*

trigona.§ *Spix.*

purpurea. *Valen.*

NON-SYMPHYNOTE ANODONTÆ.

SMOOTH.

OVAL.

*Ferussaciana. *Lea.*

*salmonia. *Lea.*

*incerta.|| *Lea.*
imbecillis? *Say.*

*Newtonensis. *Lea.*

*fluviatilis. *Lea.*
Myt. fluviatilis.¶ *Soland.* *Dill.* *Wood.*
Myt. illitus. *Soland.*
An. cataracta. *Say.*
An. marginata. *Say.*
An. implicata? *Say.*
An. teres. *Con.*

*Mortoniana. *Lea.*
An. Chiquitana. *D'Orb.*

*glauca.†† *Valen.*
An. glauca. *Lam.*

*ovata. *Lea.*

*plana. *Lea.*
An. declivis. *Con.*

*decora. *Lea.*

---

† On the authority of Des Moulins.

‡ M. Rang informs us that this species has the singular power of maintaining its vitality in the desiccated marshes of Africa, through six months of the burning sun of that region; and that he had a specimen sent to him in Paris, which was killed nearly thirteen months after it had been taken from its native bed, having occasionally been dipped in water for an hour or two only. He also mentions that the *Iridina rubens* is found with the *Chaiziana* in the Senegal, and possesses the same peculiarities of remaining in a state of torpidity during the season of great heat.

§ Ferussac considered *trigona* as the same with *crassa* of Swainson. The two figures, however, appear to me to be too different to be considered the same.

|| Dr Kirtland informs me, that a specimen of this shell, which he showed to Mr Say, was considered by Mr S. to be his *imbecillis*. If this be so, Mr Say's name is entitled to precedence. I have never seen the shell described by Mr S. as *imbecillis*.

¶ See note on *An. cygnea*, page 137.

†† The figure of this shell resembles some individuals of *Myt. fluviatilis*, Soland. (Say's *An. cataracta*), but is straighter on the superior margin. In this character it resembles the *trapezialis*. The observations of Barnes, being made when little was known of this genus, cannot now be admitted.

NON-SYMPHYNOTE ANODONTÆ.

SMOOTH.

OVAL.

*gigantea.[†] *Lea.*

subvexa. *Con.*

*Stewartiana. *Lea.*

*gibbosa. *Say.*
  An. inflata. *Major Le Conte's Cabinet.*

*grandis. *Say. Lesueur.*
  An. corpulenta. *Coop.*

SUBROTUND.

*suborbiculata. *Say.*

OBOVATE.

*obtusa. *Spix.*
  An. lituratum. *Spix.*

*sirionos. *D'Orb.*

*Patagonica. *Lam.*

NON-SYMPHYNOTE ANODONTÆ.

SMOOTH.

OBOVATE.

*lato-marginata.[‡] *Lea. D'Orb.*
  An. trapezius?[§] *Spix.*
  An. rotundus? *Spix.*

*Spixii. *D'Orb.*

porcifer.[‖] *Gray.*

*trapezialis. *Lam. Blain.*
  An. exotica.[¶] *Lam. D'Orb.*
  An. giganteus. *Spix.*
  An. pencillatus? *Gray.*
  An. Susannæ. *Gray.*
  An. radiatus. *Spix.*

*anserina. *Spix.*

Georginæ. *Gray.*

Parishii.[††] *Gray.*
  Leila Parishii. *Gray.*

*Blainvilliana.[‡‡] *Lea.*
  An. trapezialis. *Crouch.*
  Irid. trapezialis. *D'Orb.*

[†] *An. giganteus*, Spix., having been before described by Lamarck under the name of *trapezialis* and *exotica*, my species must retain this name.

[‡] The *Patagonica* and *lato-marginata*, when they are better observed, may prove to be the same.

[§] Spix's figure so closely resembles the *lato-marginata*, that I scarcely feel a doubt as to their being the same. He does not, however, notice the broad margin which is so characteristic of this species.

[‖] Never having seen this species, I place it here on Mr Gray's authority.

[¶] So far as I have been enabled to examine specimens of this and *trapezialis*, I am disposed to think they are not distinct species.

[††] On the authority of Mr Gray.

[‡‡] In my description of *Blainvilliana* (Vol. V. page 77), I observed that I was induced to believe that the animal of this shell would be found to differ from that of the genus *Anodonta*. M. D'Orbigny, in his Synopsis of the Fresh Water Shells of South America, has in fact so found it. The animal has two tubes. Nevertheless, although I then proposed if such should be the case that it should be placed in a new genus, under the name of *Columba*, I have continued it in the subgenus *Anodonta*, as, with the present artificial system, which is founded on the hinge, it could not with propriety be elsewhere classed. When the family shall be arranged in a system founded on the animal structure only, it evidently must be changed, and I doubt then if it should be placed in the *Iridina*, for although it is likely that all the species of that genus have two tubes, they do not seem to possess the deflected palleal cicatrix, which I noted in the description of *Blainvilliana*.

NON-SYMPHYNOTE ANODONTÆ.

SMOOTH.

OBOVATE.

*esula.† *Jan.*

Irid. esula. *D'Orb.*

crassa, *Swain.*

WIDE.

elongata. *Swain.*

*ensiformis. *Spix.* *D'Orb.*

*cylindracea. *Lea.*

*subcylindracea. *Lea.*

*Buchanensis. *Lea.*

*exilis. *Lea.*

OBOVATE.

*angulata. *Lea.*

NON-SYMPH. ANODON.

SMOOTH.

ARCUATE.

*tenebricosa. *Lea.* *D'Orb.*

*arcuata. *Fer.*

sinuosa. *Lam.*

*soleniformis. *D'Orb.*

The following species are unknown to me:—

Anodonta folium. *Fer.*
Anodonta Chinensis. *Fer.*
Anodonta curvatus. *Fer.*
Anodonta lugubris. *Say.*
Anodonta impura. *Say.*
Anodonta arcuta. *Cail.*
Anodonta Tævaii. *Rang.*
Anodonta Ferrarisii. *D'Orb.*
Anodonta lucida. *D'Orb.*
Anodonta Puelchana. *D'Orb.*

Fossil Species.

Anodonta? Abyssina. *Mort.*

---

† M. D'Orbigny thinks that this is my *Blainvilliana*, but having his specimens and mine of both the species, I am induced still to believe that I am correct. The two specimens resemble each other, but are certainly distinct. The deflected palleal cicatrix exists in both, but the *esula* is more rotund, and the dorsal margin is more sinuous, and the nacre bluish white, while the five or six specimens of *Blainvilliana* which I have seen are all salmon colour.

GENUS PLATIRIS.†

I. SUBGENUS IRIDINA.‡

NON-SYMPH. IRIDINÆ.

SMOOTH.

- OBOVATE.
  - ovata. *Swain.*
    - Irid. exotica. *Children.*
    - Pleiodon Macmurtriei. *Con.*
- ARCUATE.
  - exotica. *Lam.*
    - Irid. striata. *Swain.*
    - An. exotica. *Blain.*

II. SUBGENUS SPATHA.

NON-SYMPH. SPATHÆ.

SMOOTH.

- OVAL.
  - *rubens.§ *Lea.*
    - Irid. rubens. *Desh. Rang.*
    - An. rubens. *Lam. Blain.*
    - An. Clappertoni. *Kœnig*, in *Denham* and *Clapperton's* Journey.
- WIDE.
  - *Nilotica. *Lea.*
    - Irid. Nilotica. *Sow. Fer. Crouch. Caill.*
    - An. dubia ? *Bosc.*
    - Irid. Oudniœi. *Kœnig.*

---

† Genus Platiris (*nobis*), πλατυς, latus; ιρις, iris. *Testâ æquivalvis, latè transversâ; impressiones musculares grandes; cardo longus, linearis; ligamentum externum.*

‡ When Lamarck established his genus *Iridina*, he had seen but a single species, and of that only one individual, which is figured in the Encyclop. Methodique, pl. 204. Other species have been since referred to his genus, which do not seem to me to fulfil the conditions of his generic description. The phrase "cardo per longitudinem tuberculosus, subcrenatus," is by no means descriptive of the hinge belonging to the species just alluded to, which have their hinge smooth, or very slightly tuberculated. The figure in the Encyclopædia, and that of Blainville (Pl. 66, fig. 3), represent the same individual, and exhibit a character of hinge resembling in some measure that of an *Arca*. A second species, apparently agreeing with Lamarck's generic description, has been observed and described by Swainson, under the name of *Iridina ovata* (Phil. Mag. Vol. LXI.); and it has also been described by Mr Children under the name of *I. exotica*, (Brande's Journ. Vol. XV.). The specimen described in Brande's Journal is now in the British Museum, and that accurate naturalist, Mr John Edward Gray, who is one of the officers of that noble institution, informs me that he thinks it is identical with the shell upon which Mr Conrad has lately proposed to form a new genus, *Pleiodon*. Under these circumstances, it seems to me necessary to separate those shells having a *crenulated* hinge (which are true *Iridinæ*), from those having the hinge *smooth*, or very *slightly tuberculated*. I therefore arrange the *Iridina rubens*, *Nilotica*, &c., in a new subgenus, for which I propose the name of *Spatha*.

§ Mr Gray informs me that Cailliaud figures a species near to this from Egypt, which is in his possession, but I have not seen the shell or description.

NON-SYMPH. SPATHÆ.
SMOOTH.
WIDE.
Myt. Niloticus. *Wood.*
Le mutel. *Adan.*
Irid. mutel? *Rang.*

*elongata. *Lea.*
Irid. elongata. *Sow.*

*soleniformis. *Lea.*
Mycetopoda† soleniformis. *D'Orb.*

NON-SYMPH. SPATHÆ.
SMOOTH.
WIDE.
*siliquosa. *Lea.*
An. siliquosus. *Spix.*
An. pygmœum (young). *Spix.*
An. longinus. *Spix.*
Irid. longina. *Fer.*
Mycetopoda siliquosus. *D'Orb.*

*cœlestis. *Lea.*
Irid. rostrata? *Rang.*

---

† In the present arrangement, founded on the form of the hinge, I have deemed it better not to adopt D'Orbigny's genus *Mycetopoda*, founded on the natural character or habit of the animal. He says, "perforat, sicut pholadæ." In this habit it resembles *Unio oriens* (nobis), which I have elsewhere stated buries itself about twelve inches below the surface of the sand in which it lives. D'Orbigny mentions that the two anterior cicatrices are widely separated. A more important character appears to be in the fact, that the smaller cicatrix is placed before the larger one. In the *Unio* and *Anodonta* it is placed below it, and in the *Hyria* (Lam.) it is placed above, that is, in a line with the beak. I regret that I have only the very short description that this distinguished naturalist and traveller has given in his Synopsis. Should he publish these descriptions in a fuller manner, which I believe he intends, we may be so informed as not to disagree with him.

ADDENDA.

Unio Katherinæ.† *Lea.*

*Margaritana Franciscana.‡ *Lea.*
Monocondylæa Franciscana. *Mori.*

---

† *Testâ obovatâ, inæquilaterali, subcompressâ; valvulis subcrassis; natibus prominulis; dentibus cardinalibus magnis, lateralibus subrectisque; margaritâ albâ.*

Just as this sheet was going to press I had the pleasure to receive a communication from Lady Katherine Douglas, of St Mary's Isles, Scotland, accompanied by three beautiful views, drawn by her ladyship, of a shell from Lake Superior, which appears to me not to have been before observed. Wishing that it should be appended to this Synopsis, I have given a short description of it, taking the liberty to propose that lady's name for it. At a future period I hope to be able to present it with a figure from her drawings. Its place in the preceding arrangement would be immediately after *U. purpuratus* (Lam.), being an *obovate, smooth, non-symphynote Unio.*

‡ Since this sheet was in type I have received from M. Moricand, of Geneva, a specimen of this interesting shell. Its place in this Synopsis would be between *M. calceola* and *Bonellii,* under the division *subrotund, smooth, non-symphynote Margaritanæ.* I owe to the kindness of this gentlemen also the *U. rotundus* (Spix and Wagner), and find it distinct from *U. Paranensis* (nobis), a matter which has been doubted by M. Moricand.

In Professor Rafinesque's Monograph, and in his subsequent Papers, are inserted descriptions under the following names. Not being able to identify them, I have deemed it better simply to give a catalogue of them. Those which I suppose I have identified will be found in the foregoing table.

Alasmodonta atropurpureum ?
badium ?
costata ?
hians ?
ponderosum ?
papyraceum ?
rugosum ?
sulcatum ?
scriptum ?
viridis ?

Anodonta atra ?
aperta ?
cuneata ?
digonota ?
inflata ?
lata ?
Ohiensis ?
solenoides ?

Unio antrosa ?
atroviolacea ?
argyratus ?
attenuata ?
aurata ?
bicolor ?
bullata ?
biloba ?
cardium ?
Cliffordiana ?
calendis ?
chloris ?
castaneus ?
crassa ?
cinerescens ?
cuneata ?

Unio cyclips ?
cuprea ?
cyphia ?
decorticata ?
diploderma ?
diaphanus ?
ellipsaria ?
elliptica ?
fasciata ?
fulvus ?
fontinalis ?
fulgens ?
fasciolaris ?
flava ?
flexus ?
fragilis ?
granulatus ?
interrupta ?
lateralis ?
latissima ?
leptodon ?
lævigata ?
lamobrachys ?
lineolata ?
lividus ?
megaptera ?
montanus ?
melaplata ?
nervosa ?
nodulata ?
obliquata ?
obovalis ?
olivaria ?
ovata ?
Paphos ?
pachostea ?

Unio ponderosus ?
pallida ?
plateolus ?
pusella ?
pallens ?
perplexus ?
quadrula ?
retusa ?
rimosus ?
rosea ?
rivularis ?
stegaria ?
sintoxia ?
sinuata ?
solenoides ?
striata ?
subrotunda ?
torulosa ?
teneltus ?
triangularis ?
triqueter ?
truncata ?
verrucosa ?
viridis ?
vittatus ?
Venus ?
zonalis ?

Odatelia radiata ?

Lasmonos fragilis ?

Diplasma marginatæ ?
similis ?
vitrea ?
striata ?

GEOGRAPHICAL DISTRIBUTION OF THE SPECIES OF THE FAMILY NAIADES.

To render the preceding Synoptical Arrangement more complete, it was deemed advisable to make such a table as would throw together the species from each great division of the world; and to make this more useful, it has been thrown into alphabetic arrangement.

GENUS MARGARITA.

I. SUBGENUS UNIO.

EUROPE.

Batavus. *Lam.*
crassissimus. *Fer.*
elongatus. *Pfeif.*
litoralis. *Lam.*
ovalis. *Flem.*
pictorum. *Lam.*
platyrhynchus. *Rossmaesler.*

ASIA.

Bengalensis. *Lea.*
bilineatus. *Lea.*
cœruleus. *Lea.*
corrugatus. *Lam.*
Corrianus. *Lea.*
Grayanus. *Lea.*
lamellatus. *Lea.*
Leaii. *Gray.*
marginalis. *Lam.*
Murchisonianus. *Lea.*
olivarius. *Lea.*
ponderosus. *Lea.*
tigris. *Fer.*

AFRICA.

divaricatus. *Lea.*
Egyptiacus. *Cailliaud.*
Niloticus. *Fer.*

NORTH AMERICA.

acutissimus. *Lea.*
Æsopus. *Green.*

alatus. *Say.*
altilis. *Con.*
Anodontoides. *Lea.*
angustatus. *Lea.*
apiculatus. *Say.*
arcæformis. *Lea.*
arctior. *Lea.*
arctatus. *Con.*
arcus. *Con.*
asperrimus. *Lea.*
asper. *Lea.*
Barnesianus. *Lea.*
Blandingianus. *Lea.*
brevidens. *Lea.*
camelus. *Lea.*
camptodon. *Say.*
capsæformis. *Lea.*
carbonarius. *Lea.*
cariosus. *Say.*
castaneus. *Lea.*
Claibornensis. *Lea.*
clavus. *Lam.*
circulus. *Lea.*
cœlatus. *Con.*
coccineus. *Lea.*
compressus. *Lea.*
complanatus. *Lea.*
confertus. *Lea.*
Congaræus. *Lea.*
Conradicus. *Lea.*
contradens. *Lea.*
Cooperianus. *Lea.*
cor. *Con.*
cornutus. *Bar.*
crassidens. *Lam.*
crassus. *Say.*
creperus. *Lea.*
cuprinus. *Lea.*
Cumberlandianus. *Lea.*
cylindricus. *Say.*
decisus. *Lea.*
declivis. *Say.*
dehiscens. *Say.*
dolabriformis. *Lea.*
donaciformis. *Lea.*
Dorfeuillianus. *Lea.*
dromas. *Lea.*
ebenus. *Lea.*
elegans. *Lea.*
ellipsis. *Lea.*
fabalis. *Lea.*
Fisherianus. *Lea.*
foliatus. *Hild.*
folliculatus. *Lea.*
fragosus. *Con.*
fulvus. *Lea.*
gibbosus. *Bar.*
gibber. *Lea.*
glaber. *Lea.*
glans. *Lea.*
globosus. *Lea.*
gracilis. *Barnes.*
graniferus. *Lea.*
Greenii. *Con.*
Griffithianus. *Lea.*
Haysianus. *Lea.*
heterodon. *Lea.*
Hildrethianus. *Lea.*
Hopetonensis. *Lea.*
Hydianus. *Lea.*
inflatus. *Lea.*
infucatus. *Con.*
interruptus. *Lea.*
iris. *Lea.*
irroratus. *Lea.*
Jayensis. *Lea.*
jejunus. *Lea.*
Katherinæ. *Lea.*
Kirklandianus. *Lea.*
lævissimus. *Lea.*
lacrymosus. *Lea.*
lanceolatus. *Lea.*

Lecontianus. *Lea.*
lens. *Lea.*
lienosus. *Con.*
lugubris. *Lea.*
luteolus. *Lam.*
maculatus. *Con.*
Masoni. *Con.*
Medellinus. *Lea.*
Menkianus. *Lea.*
metanever. *Lea.*
Mühlfeldianus. *Lea.*
multiplicatus. *Lea.*
multiradiatus. *Lea.*
mytiloides. *Raf.*
modioliformis. *Lea.*
monodontus. *Say.*
Nashvillianus. *Lea.*
nasutus. *Say.*
notatus. *Lea.*
Novi-Eboraci. *Lea.*
obesus. *Lea.*
obliquus. *Lam.*
obscurus. *Lea.*
occidens. *Lea.*
ochraceus. *Say.*
orbiculatus. *Hild.*
ovatus. *Say.*
palliatus. *Lea.*
parvus. *Bar.*
patulus. *Lea.*
pectorosus. *Con.*
penitus. *Con.*
perdix. *Lea.*
perovatus. *Con.*
perovalis. *Con.*
perplexus. *Lea.*
personatus. *Say.*
phaseolus. *Hild.*
Phillipsii. *Con.*
pictus. *Lea.*
pileus. *Lea.*
pliciferus. *Lea.*
plicatus. *Lesueur.*
productus. *Con.*
pulcher. *Lea.*
pumilis. *Lea.*
purpuratus. *Lam.*
pustulatus. *Lea.*
pustulosus. *Lea.*
pyramidatus. *Lea.*
radiatus. *Lam.*
Rangianus. *Lea.*
Ravenelianus. *Lea.*
rectus. *Lam.*
retusus. *Lam.*
Roanokensis. *Lea.*
rotundatus. *Lam.*
rubellus. *Con.*
rubiginosus. *Lea.*
Schoolcraftensis. *Lea.*
securis. *Lea.*
Shepardianus. *Lea.*
simus. *Lea.*
solidus. *Lea.*
Sowerbianus. *Lea.*
spinosus. *Lea.*
splendidus. *Lea.*
stapes. *Lea.*
stramineus. *Con.*
subovatus. *Lea.*
subrotundus. *Lea.*
subtentus. *Say.*
sulcatus. *Lea.*
Taitianus. *Lea.*
Tampicoensis. *Lea.*
Tappanianus. *Lea.*
tæniatus. *Con.*
tenuissimus. *Lea.*
tenerus. *Rav.*
tetralasmus. *Say.*
trapezoides. *Lea.*
triangularis. *Bar.*

trigonus. *Lea.*
Troostensis. *Lea.*
tuberculatus. *Bar.*
turgidus. *Lea.*
undulatus. *Bar.*
Vanuxemensis. *Lea.*
varicosus. *Lea.*
Vaughanianus. *Lea.*
ventricosus. *Bar.*
venustus. *Lea.*
verrucosus. *Bar.*
vibex. *Con.*
Watereensis. *Lea.*
Zeiglerianus. *Lea.*
zigzag. *Lea.*

SOUTH AMERICA.

ambiguus. *Lea.*
angulatus. *Lea.*
atratus. *Lea.*
auratus. *Lea.*
Brownianus. *Lea.*
Burroughianus. *Lea.*
charruanus. *D'Orb.*
Childreni. *Gray.*
depressus. *Lam.*
delodontus. *Lam.*
faba. *D'Orb.*
gigas. *Lea.*
granosus. *Brug.*
membranaceus. *Lea.*
modestus. *Fer.*
multistriatus. *Lea.*
Paranensis. *Lea.*
parallelopipedon. *Lea.*
Patagonicus. *D'Orb.*
rhombeus. *Wag.*
syrmatophorus. *Lea.*
variabilis. *Lea.*

NEW HOLLAND.

Australis. *Lam.*
Novæ Hollandiæ. *Gray.*

HABITAT UNKNOWN.

angustus. *Lam.*
Cailliaudii. *Fer.*
emarginatus. *Lea.*
discus. *Lea.*
Nicklinianus. *Lea.*
nodulosus. *Lea.*
Smithii. *Gray.*
truncatus. *Swain.*

II. SUBGENUS MARGARITANA.

EUROPE.

Bonellii. *Lea.*
margaritifera. *Lea.*

NORTH AMERICA.

arcula. *Lea.*
calceola. *Lea.*
complanata. *Lea.*
confragosa. *Lea.*
deltoidea. *Lea.*
fabula. *Lea.*
Holstonia. *Lea.*
marginata. *Lea.*
radiata. *Lea.*
Raveneliana. *Lea.*
rugosa. *Lea.*
undulata. *Lea.*

SOUTH AMERICA.

Corrientesensis. *Lea.*
fossiculifera. *Lea.*

Franciscana. *Lea.*
Guarayana. *Lea.*
Minuana. *Lea.*
Paraguayana. *Lea.*
Parchappii. *Lea.*

I am unable to place the following in the table :

AFRICA.

Alasmodonta Tripolitina. *Fer.*

SOUTH AMERICA.

Alasmodonta incurva. *Fer.*

III. SUBGENUS DIPSAS.

ASIA.

discoideus. *Lea.*
plicatus. *Leach.*

IV. SUBGENUS ANODONTA.

EUROPE.

cygnea. *Drap.*

ASIA.

magnifica. *Lea.*
Woodiana. *Lea.*

AFRICA.

arcuata. *Fer.*
Chaiziana. *Rang.*

NORTH AMERICA.

angulata. *Lea.*
Benedictensis. *Lea.*
Buchanensis. *Lea.*
cylindracea. *Lea.*
decora. *Lea.*
edentula. *Lea.*
fragilis. *Lam.*
Ferussaciana. *Lea.*
fluviatilis. *Lea.*
gibbosa. *Say.*
gigantea. *Lea.*
glauca. *Valen.*
grandis. *Say.*
incerta. *Lea.*
Newtonensis. *Lea.*
Nuttalliana. *Lea.*
Oregonensis. *Lea.*
ovata. *Lea.*
pavonia. *Lea.*
Pepiniana. *Lea.*
plana. *Lea.*
salmonia. *Lea.*
Stewartiana. *Lea.*
suborbiculata. *Say.*
subcylindracea. *Lea.*
subvexa. *Con.*
Wahlamatensis. *Lea.*
Wardiana. *Lea.*

SOUTH AMERICA.

anserina. *Spix.*
Blainvilliana. *Lea.*
crassa. *Swain.*
elongata. *Swain.*
ensiformis. *Spix.*
esula. *Jan.*
Georginæ. *Gray.*
lato-marginata. *Lea.*
limnoica. *D'Orb.*

Mortoniana. *Lea.*
obtusa. *Spix.*
Parishii. *Gray.*
Patagonica. *Lam.*
porcifer. *Gray.*
Spixii. *D'Orb.*
sinuosa. *Lam.*
sirionos. *D'Orb.*
soleniformis. *D'Orb.*
tenebricosa. *Lea.*
trapezialis. *Lam.*
trigona. *Spix.*

NEW HOLLAND.

purpurea. *Valen.*

HABITAT UNKNOWN.

crispata. *Lam.*
exilis. *Lea.*
uniopsis. *Lam.*
undulata. *Say.*

The following species are unknown to me:—

EUROPE.

Anodonta curvatus. *Fer.*

ASIA.

Anodonta folium. *Fer.*
Anodonta Chinensis. *Fer.*

AFRICA.

Anodonta arcuta. *Caill.*
Tawaii. *Rang.*

NORTH AMERICA.

Anodonta lugubris. *Say.*
Anodonta impura. *Say.*

FOSSIL SPECIES.

NORTH AMERICA.

Anodonta? Abyssina. *Mort.*

GENUS PLATIRIS.

I. SUBGENUS IRIDINA.

AFRICA.

ovata. *Swainson.*

HABITAT UNKNOWN.

exotica. *Lam.*

II. SUBGENUS SPATHA.

AFRICA.

cœlestis. *Lea.*
elongata. *Lea.*
Nilotica. *Lea.*
rubens. *Lam.*

SOUTH AMERICA.

siliquosa. *Lea.*
soleniformis. *Lea.*

Not being able satisfactorily to make out or arrange the following species, I have deemed it best simply to insert a list, in their order of habitat.

EUROPE.

Unio rubens. *Menke.*
Unio rugatus. *Menke.*
Unio gibbus.† *Speng.*
Unio truncatus.† *Speng.*

ASIA.

Unio orientalis. *Fer.*

AFRICA.

Unio Juliani. *Rang.*

NORTH AMERICA.

Unio Grœnlandicus.† *Schrö.*
Unio purpuriatus. *Say.*
Unio oviformis. *Con.*
Unio furvus. *Con.*

SOUTH AMERICA.

Unio nitidens. *Fer.*
Unio obtusus. *Fer.*
Unio preciosus. *Fer.*
Unio psammoica. *D'Orb.*
Unio rhuacoica. *D'Orb.*
Unio Fontainiana. *D'Orb.*
Unio hylæa. *D'Orb.*
Unio Guaraniana. *D'Orb.*

HABITAT UNKNOWN.

Unio pulchellus. *Fer.*
Unio musivus.† *Speng.*

The following Fossil species have been observed in Great Britain:—

Unio crassiusculus. *Sow.*
Unio concinnus. *Sow.*
Unio uniformis. *Sow.*
Unio acutus. *Sow.*
Unio Listeri. *Sow.*
Unio Solandri. *Sow.*
Unio porrectus. *Sow.*
Unio compressus. *Sow.*
Unio antiquus. *Sow.*
Unio aduncus. *Sow.*
Unio cordiformis. *Sow.*
Unio crassissimus. *Sow.*
Unio subconstrictus. *Sow.*
Unio hybridus. *Sow.*
Unio Urii. *Flem.*
Unio abductus. *Phil.*
Unio peregrinus. *Phil.*

The following have been observed in the United States:

Unio petrosus. *Mort.*
Unio tumulatis. *Mort.*
Unio terrenus. *Mort.*
Unio saxulum. *Mort.*

---

† On the authority of Ferussac.

LIST OF AUTHORS.

The following Authors are quoted, and their names chiefly abbreviated.

Adan.—Adanson.

Bosc.
Bouil.—Bouillet.
Blain.—Blainville.
Bar.—Barnes.
Brug.—Bruguière.
Ben.—Benson.

Crouch.
Con.—Conrad.
Chem.—Chemnitz.
Caill.—Cailliaud.
Cooper.
Children.

Dill.—Dillwyn.
Desh.—Deshayes.
Drap.—Draparnaud.
Des Moul.—Des Moulins.
Don.—Donovan.
Den.—Denham.
D'Orb.—D'Orbigny.

Eat.—Eaton.

Fer.—Ferussac.
Flem.—Fleming.
Fork.—Forkeil.
Far.—Farines.

Gray.
Green.
Grat.—Grateloup.
Grono.—Gronovius.
Gmel. Gmelin.

Hild.—Hildreth.
Humph.—Humphreys.

Jan.

Klein.
Knorr.
Kœnig.

Lam.—Lamarck.
Lesueur.
List.—Lister.
Less.—Lesson.

Mort.—Morton.
Mich.—Michaud.
Monta.—Montagu.
Mori.—Moricand.
Mat.—Maton.
Mühl.—Mühlfeld.
Menke.

Nil.—Nilsson.

Poir.—Poiret.
Petiv.—Petiver.
Pfeif.—Pfeiffer.
Poli.
Pay.—Payraudeau.
Phil.—Phillips.

Retz.—Retzius.
Rav.—Ravenel.
Ross.—Rossmaesler.
Raf.—Rafinesque.
Rang.

Shep.—Shepherd.
Speng.—Spengler.
Stud.—Studer.
Schmidt.
Schroet.—Schroeter.
Solan.—Solander.
Sow.—Sowerby.
Schum.—Schumaker.
Spix.
Swain.—Swainson.
Say.

Turt.—Turton.

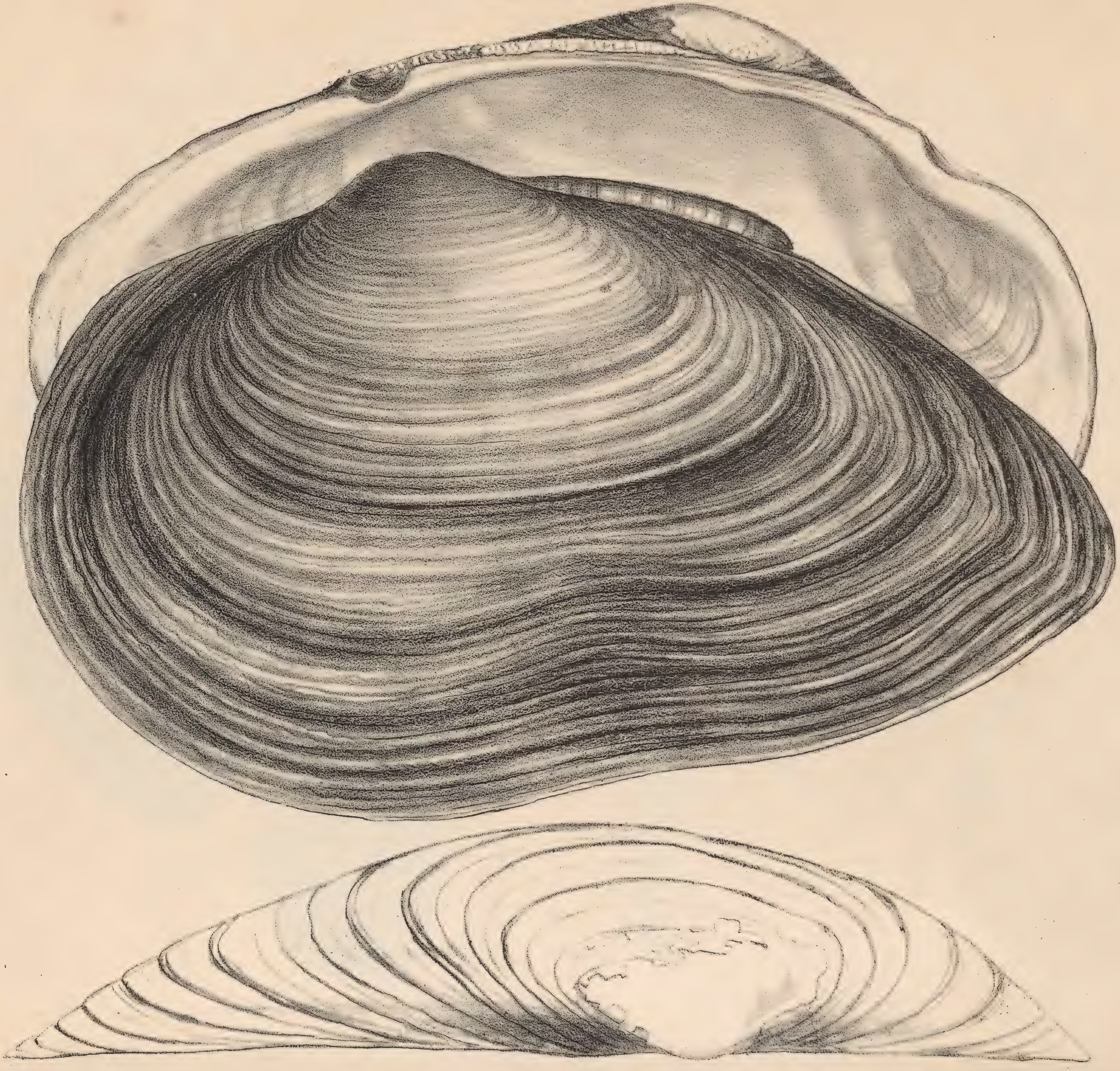
Valen.—Valencienes.

Wag.—Wagner.
Wood.

Yoldi.

Zeig.—Zeigler.

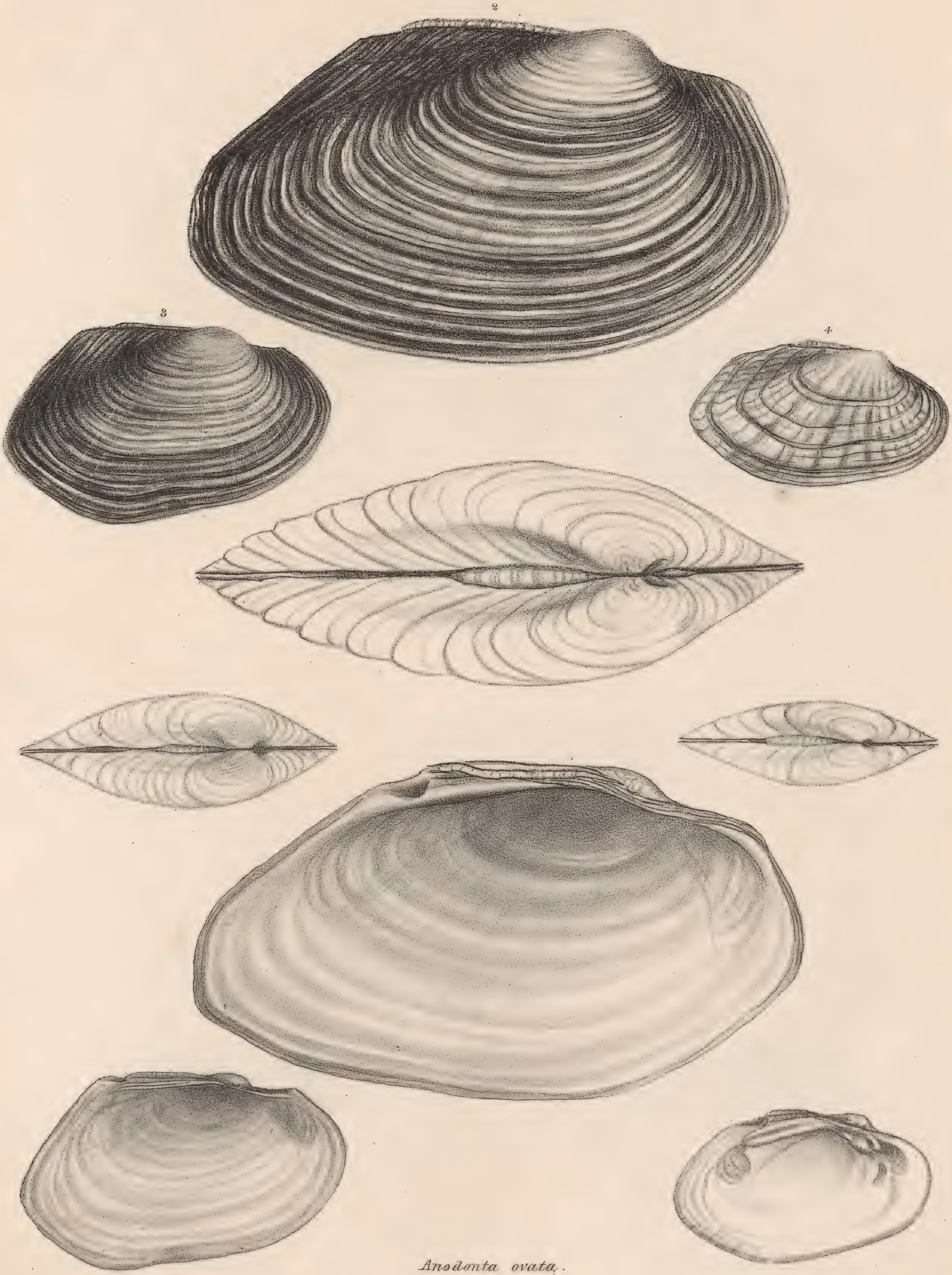
PL. 1 Vol. 6.



Anodonta gigantea.

[illegible] by J.Drayton.

PL. II Vol. 6.



Anodonta ovata.

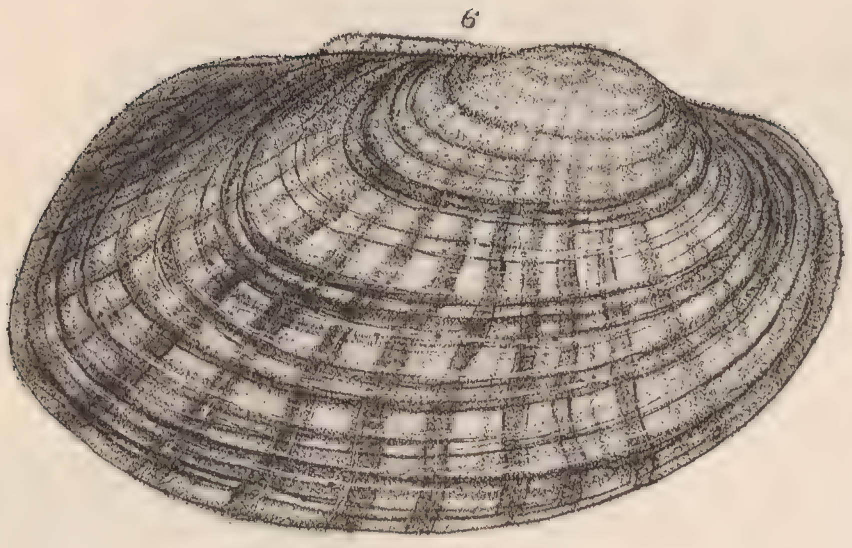
Unio Bengalensis.

Unio Venustus.

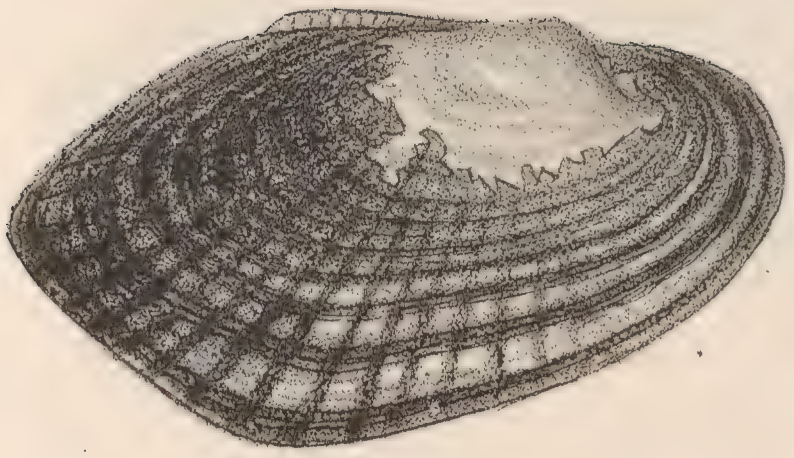
Drawn on stone by J. Drayton

PL. III Vol. 6.

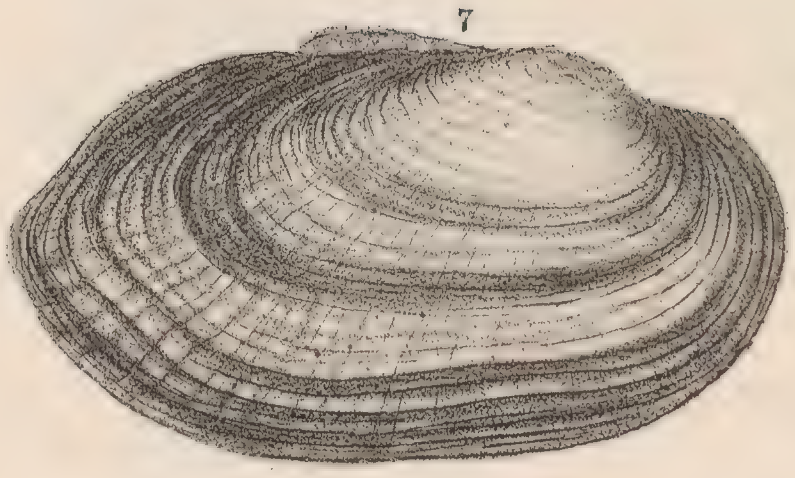
6

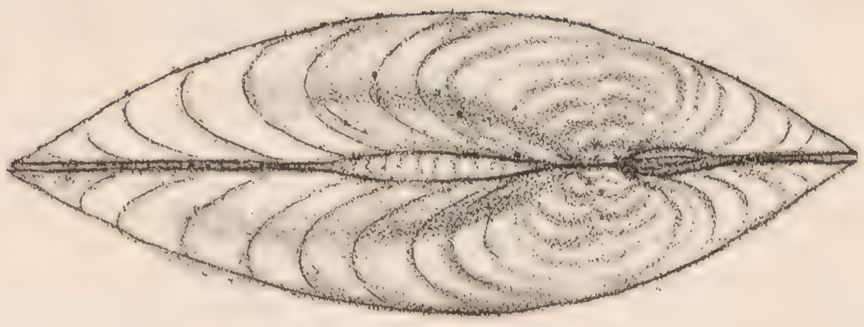


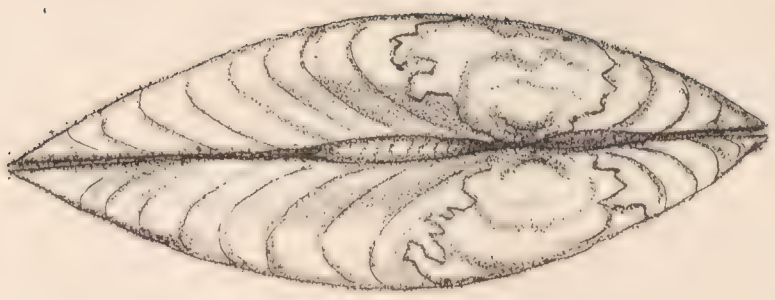
5

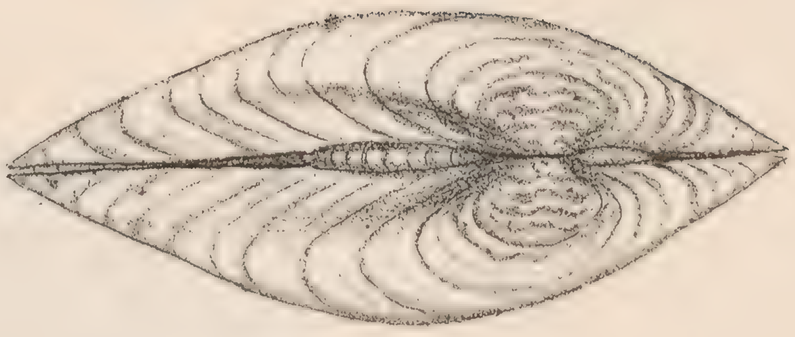


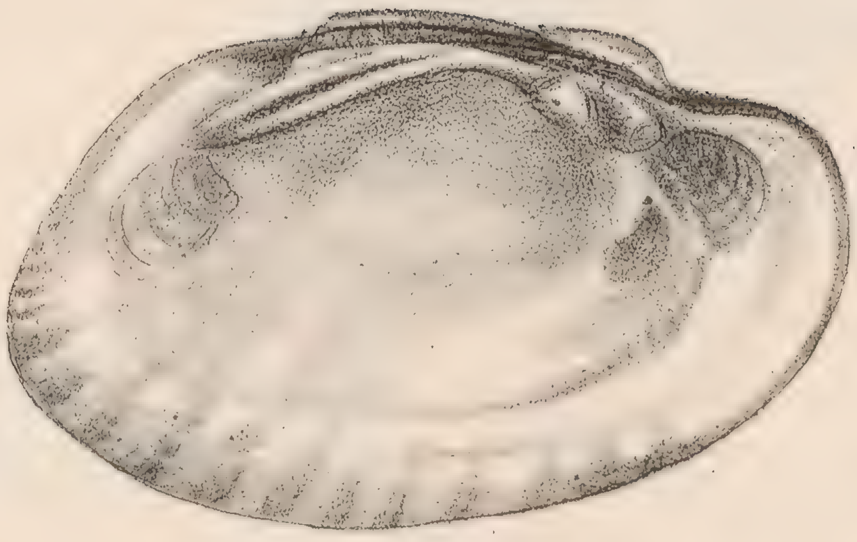
7

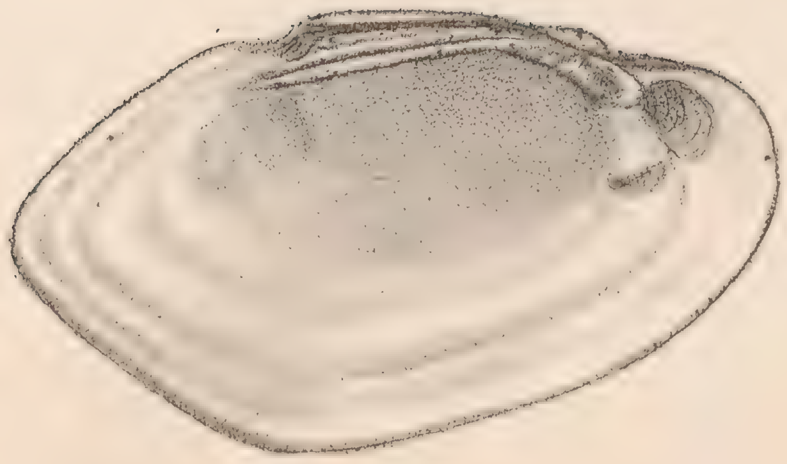


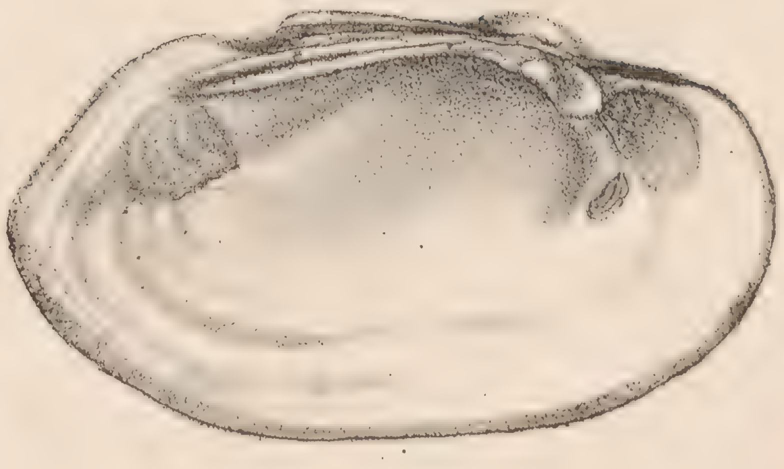












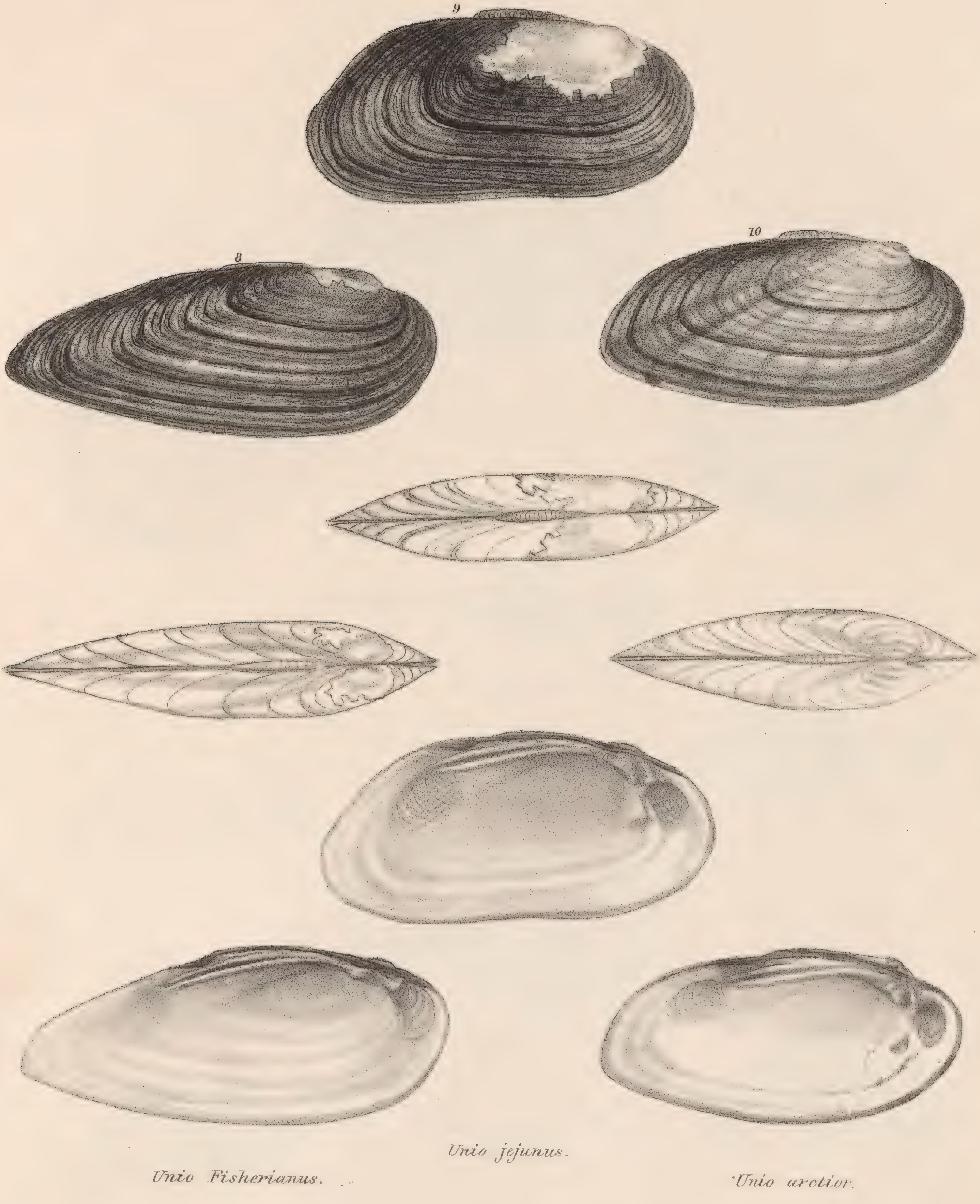
Unio pulcher.

Unio Vaughanianus.

Unio obscurus.

Drawn on stone by J.Drayton.

PL. IV Vol. 6.



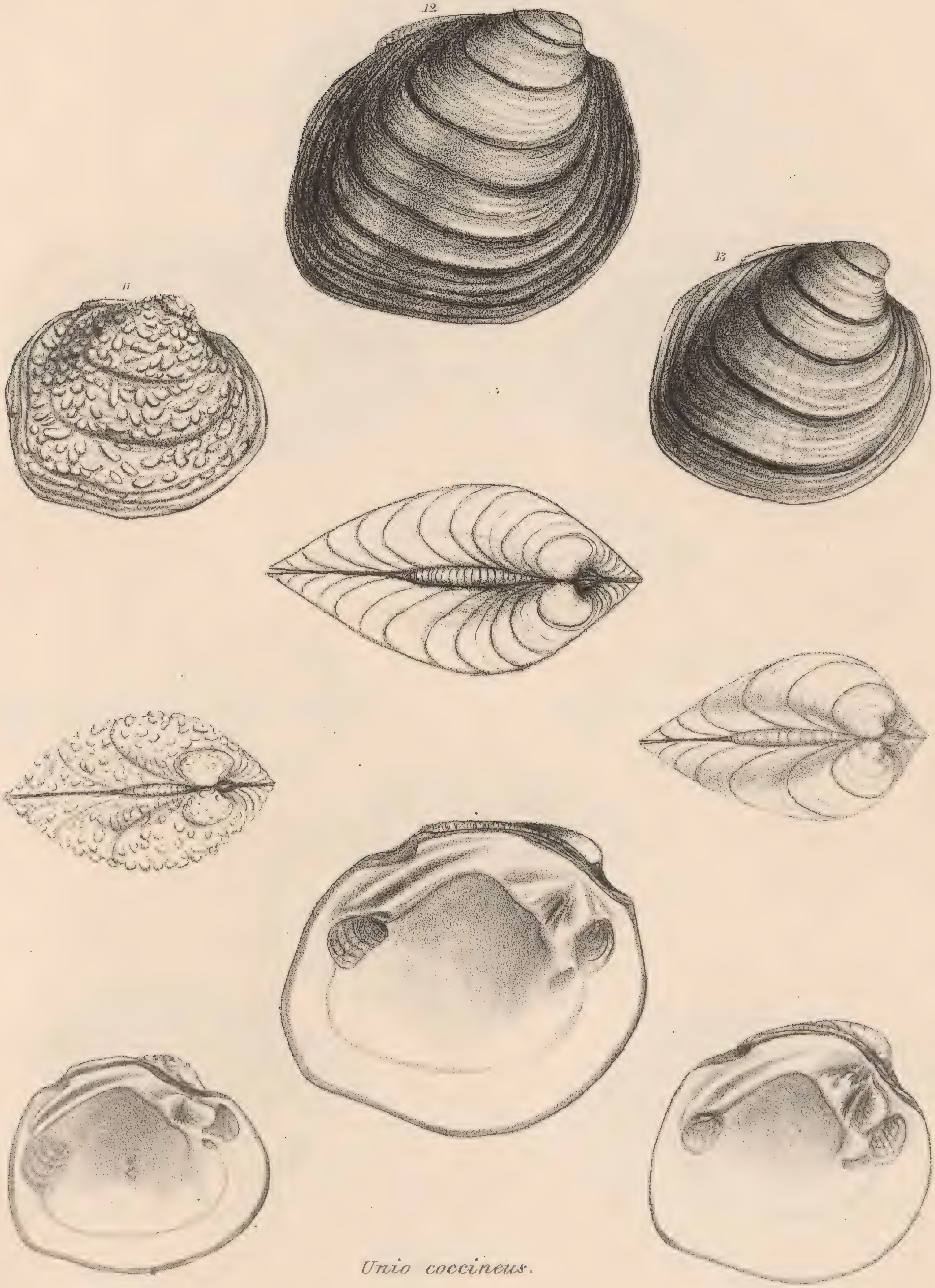
Unio Fisherianus.

Unio jejunus.

Unio arctior.

Drawn on Stone by J. Drayton.

PL. V Vol. 6.



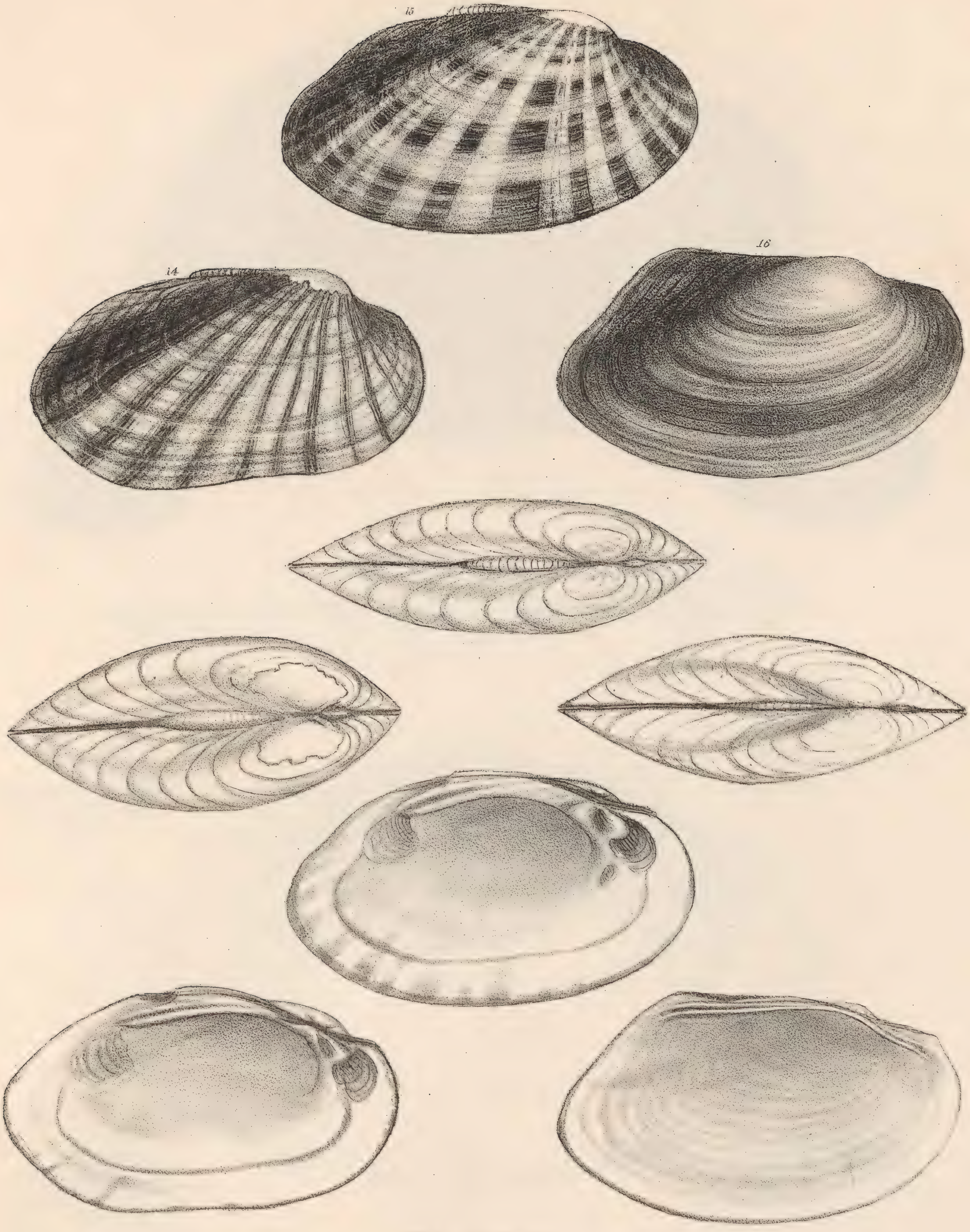
Unio coccineus.

Unio turgidus.

Unio solidus.

Drawn by J. Drayton.

PL. VI Vol. 6.



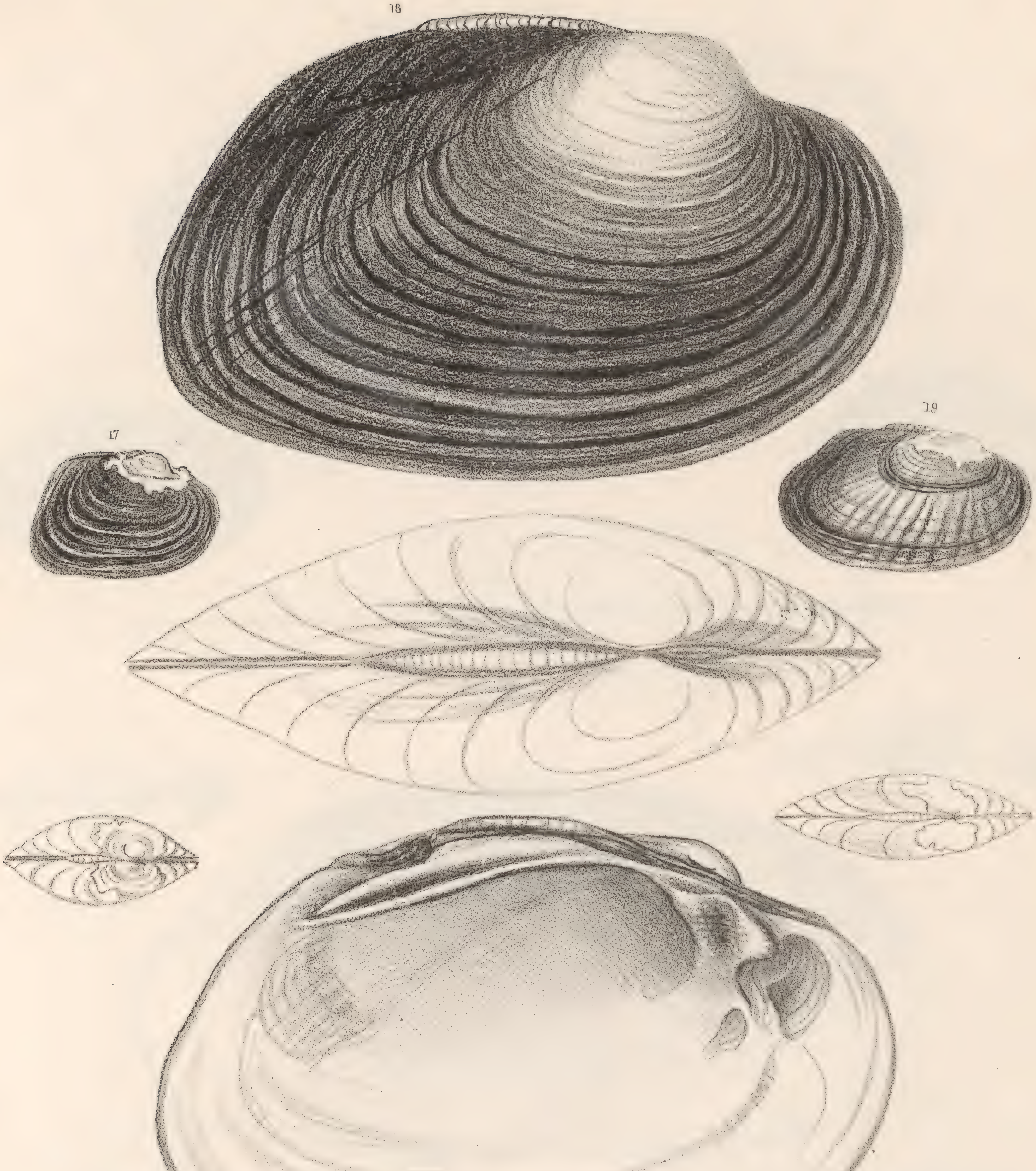
Unio interruptus.

Unio Hydianus.

Unio lamellatus.

Drawn on Stone by J. Drayton.

PL. VII Vol. 6.



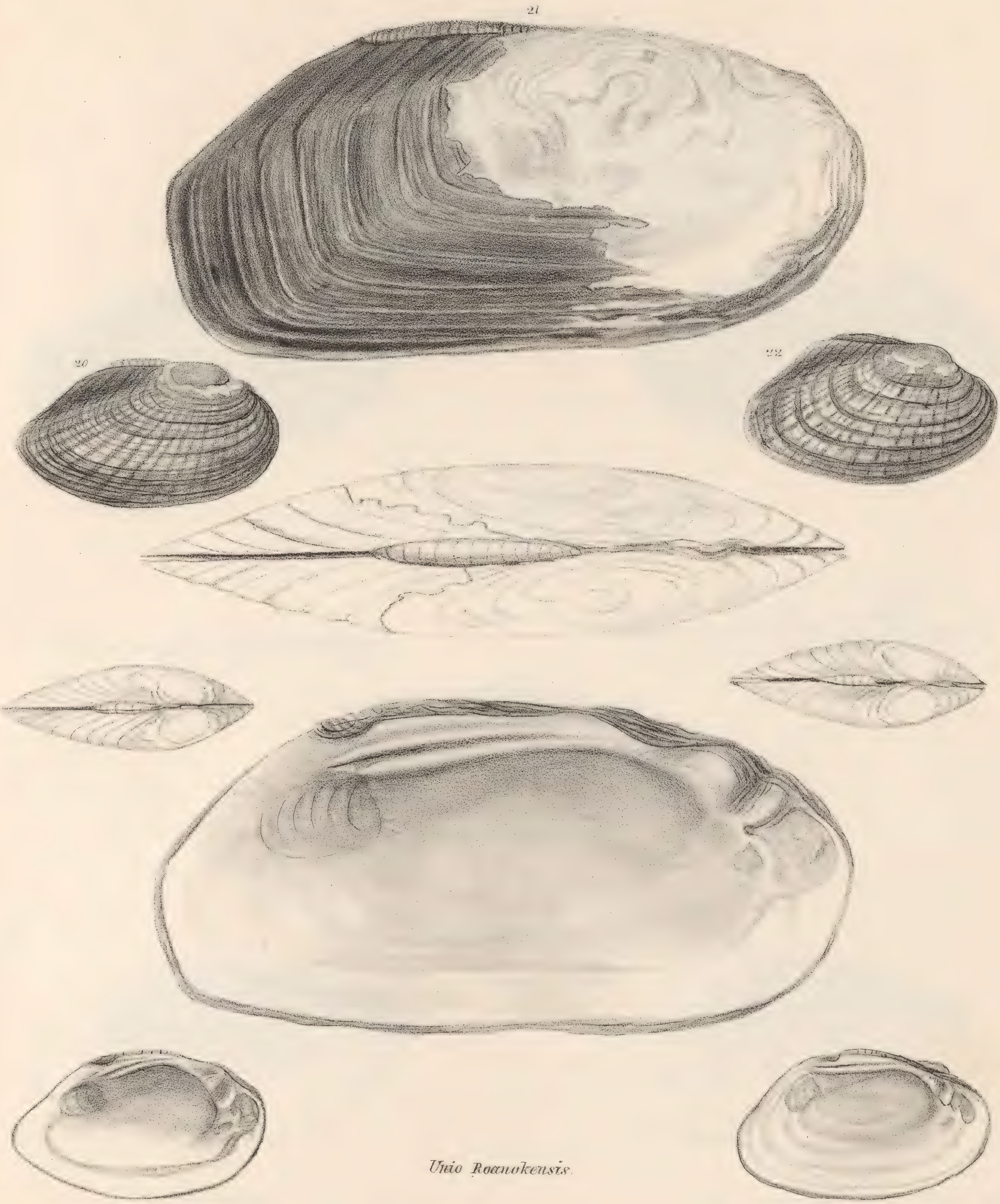
Unio Tampicoensis.

Unio pumilus.

Unio Cumberlandicus.

J. Drayton del. & lithog.

PL. VIII Vol. 6.



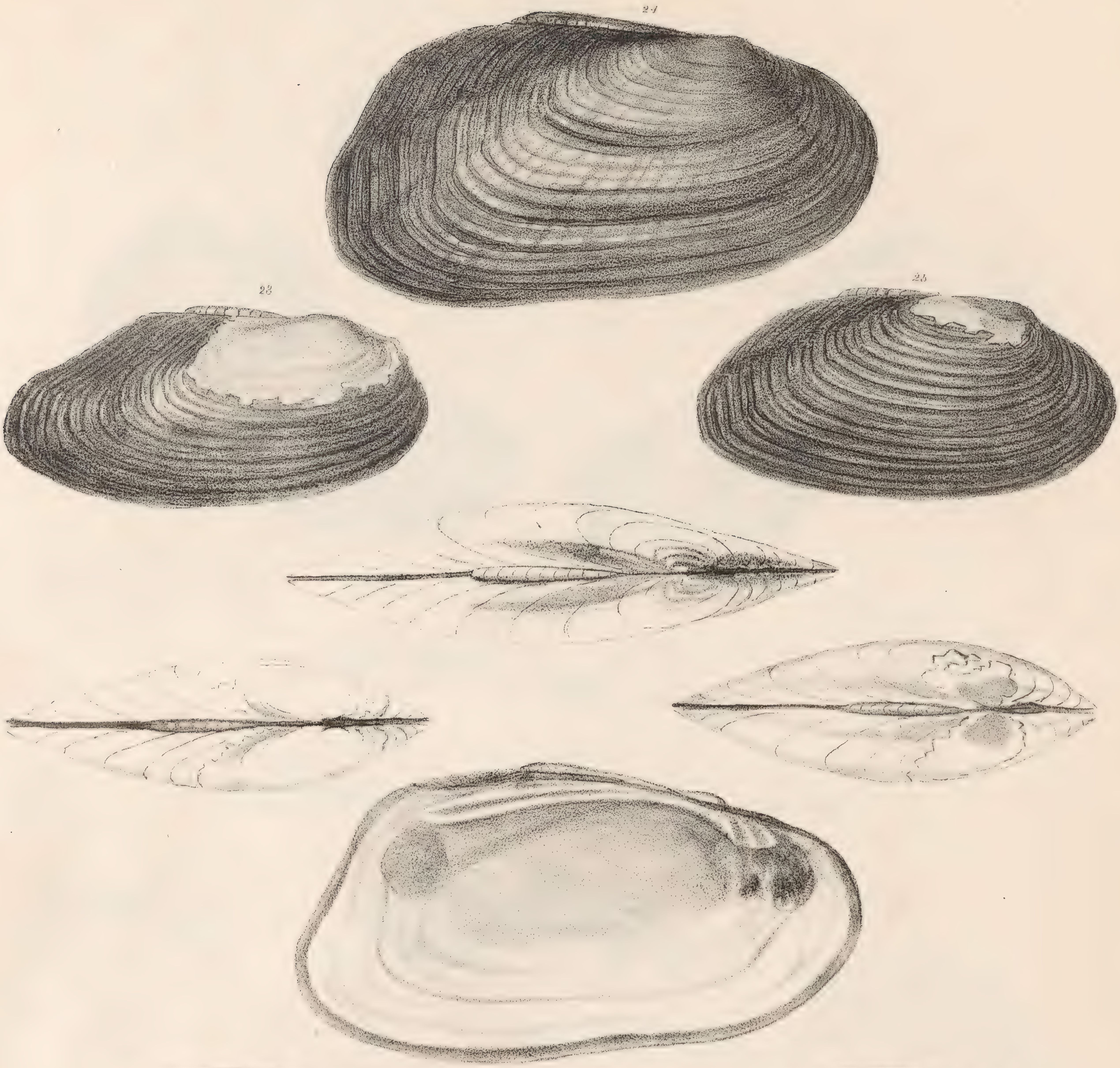
Unio Roanokensis.

Unio simus.

Unio notatus.

J. Drayton Del.

PL. IX Vol. 6



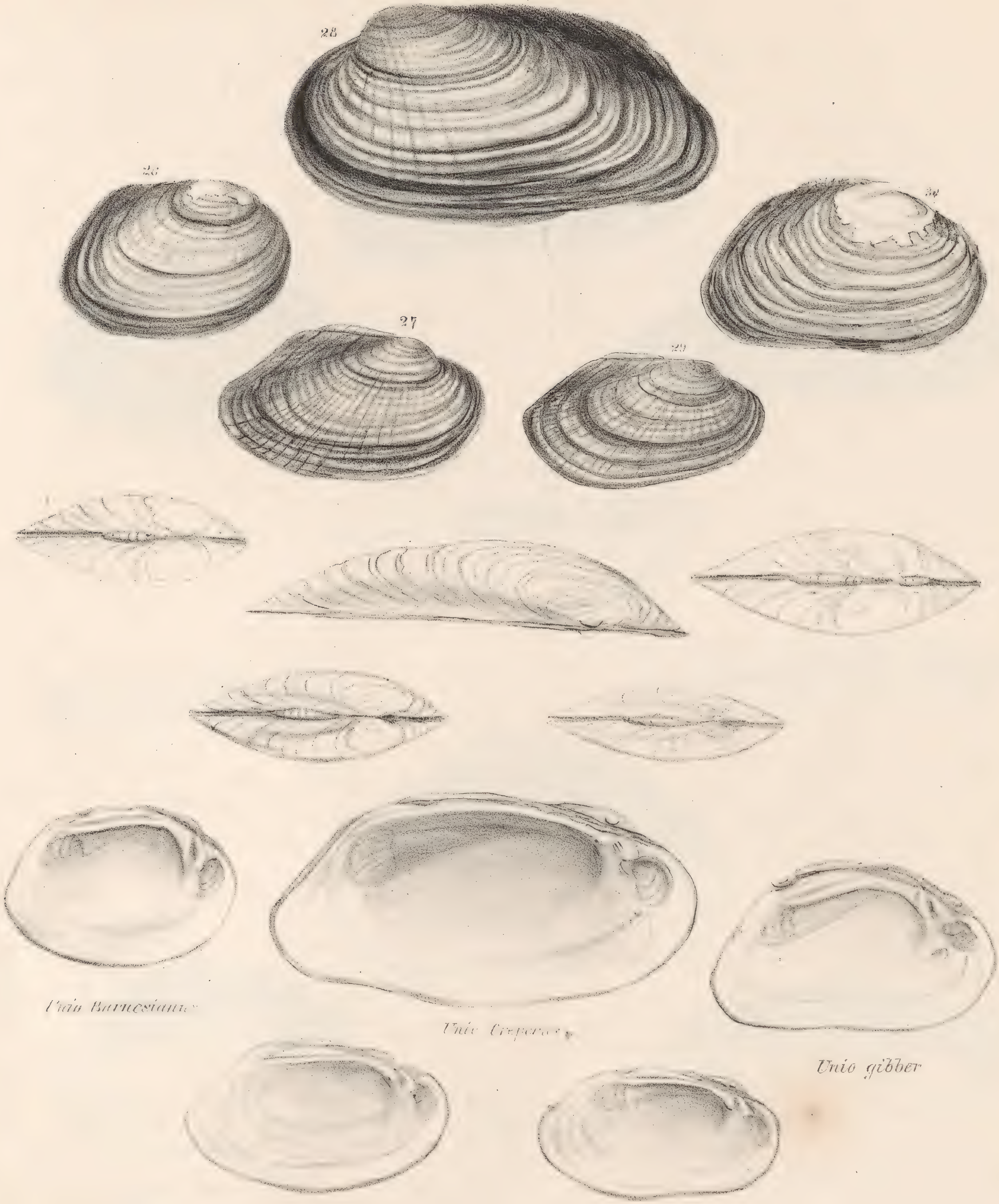
Unio Hopetonensis

Unio Jayensis

Unio lugubris

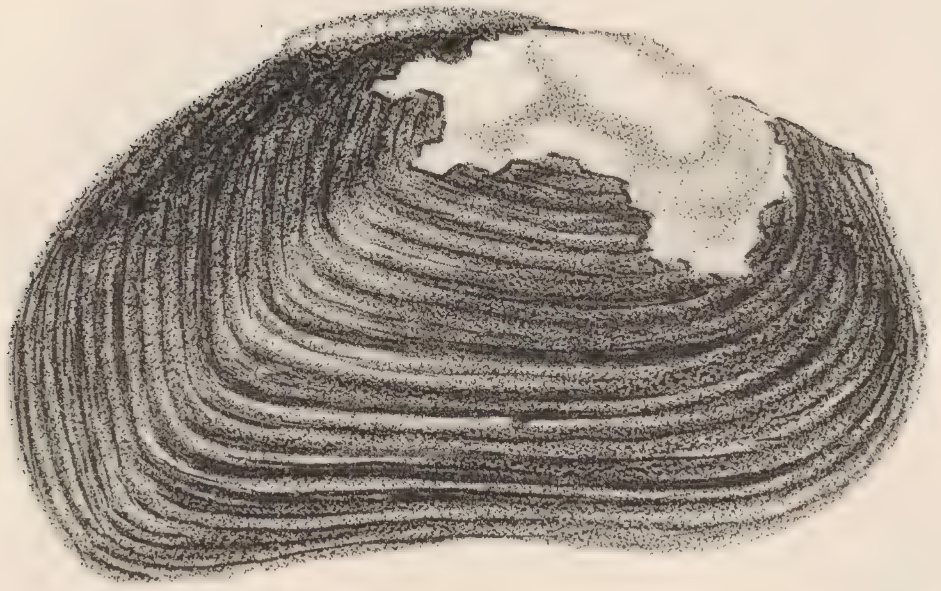
Drawn by J.Drayton

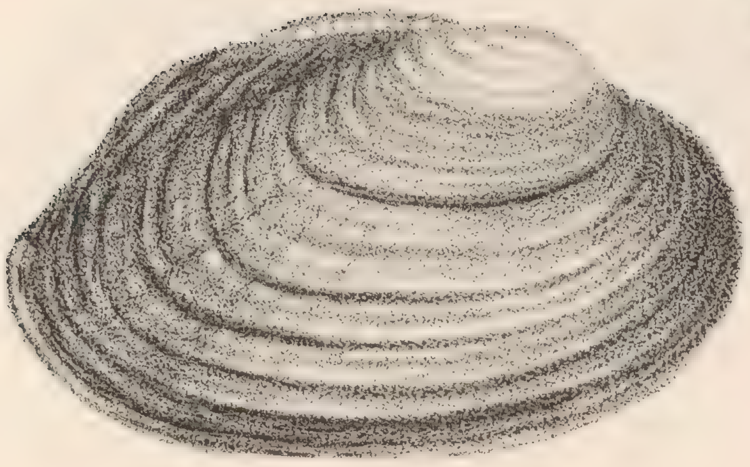
PL. X Vol. 6.

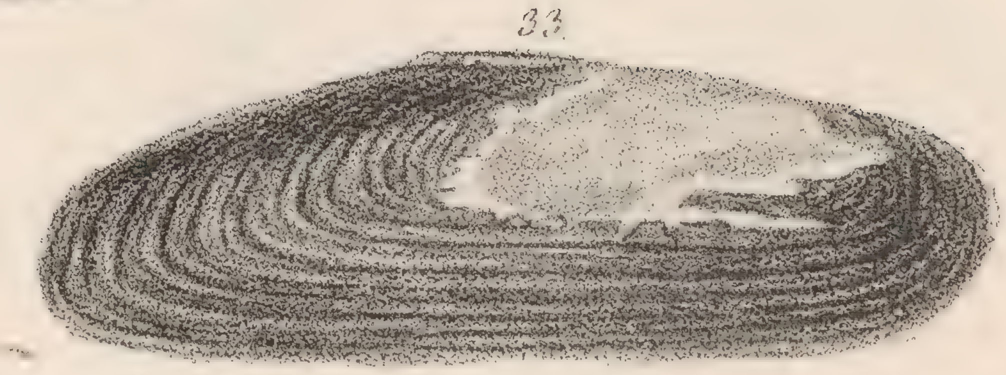


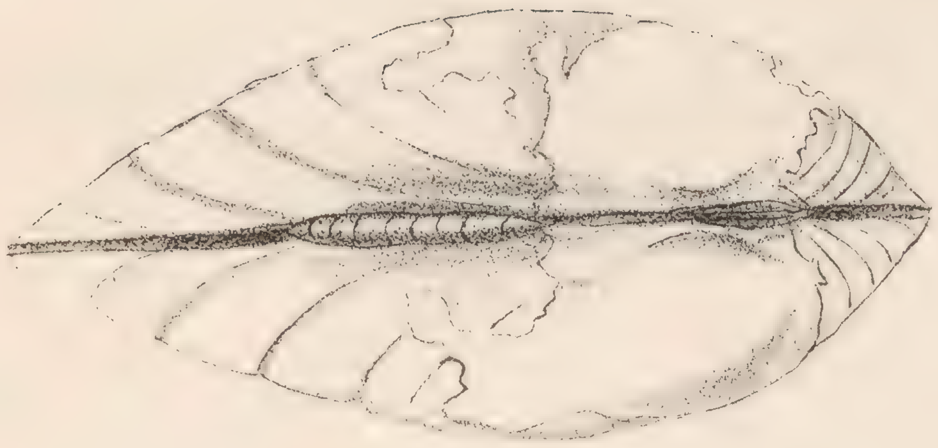
J Drayton del.

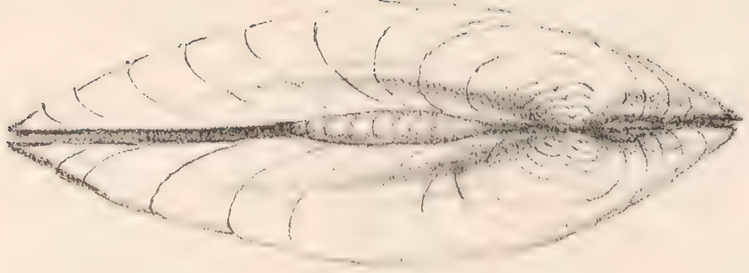
PL. XI. Vol 6

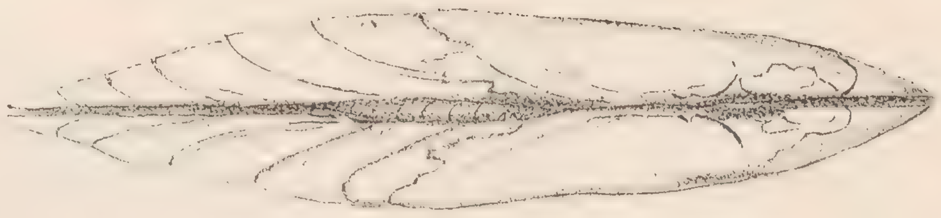


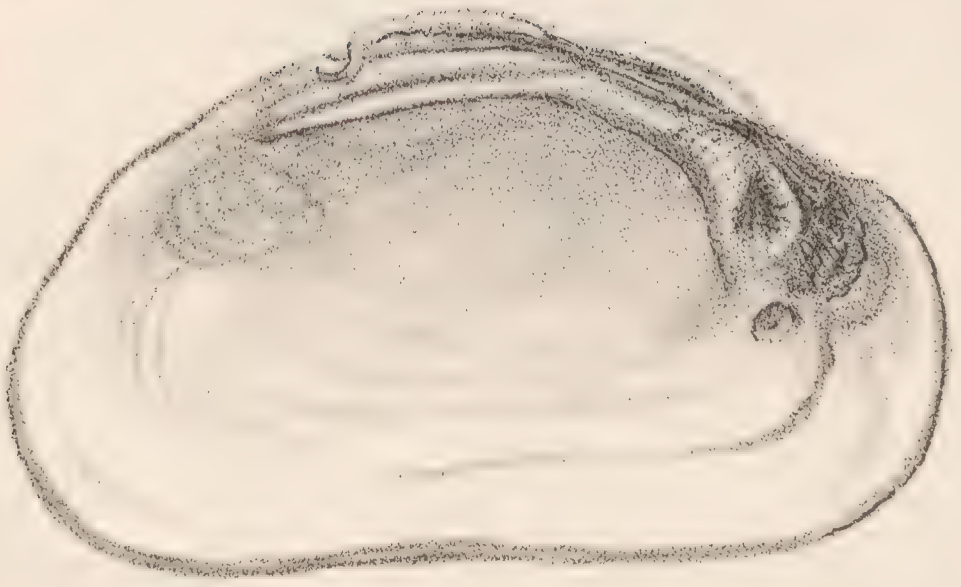


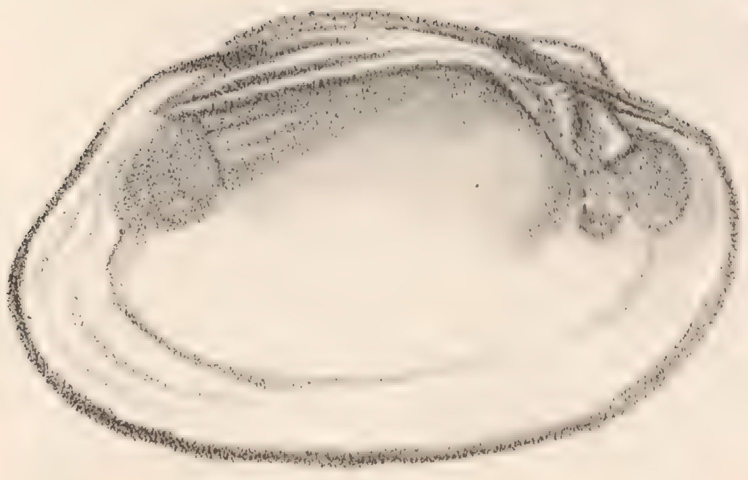


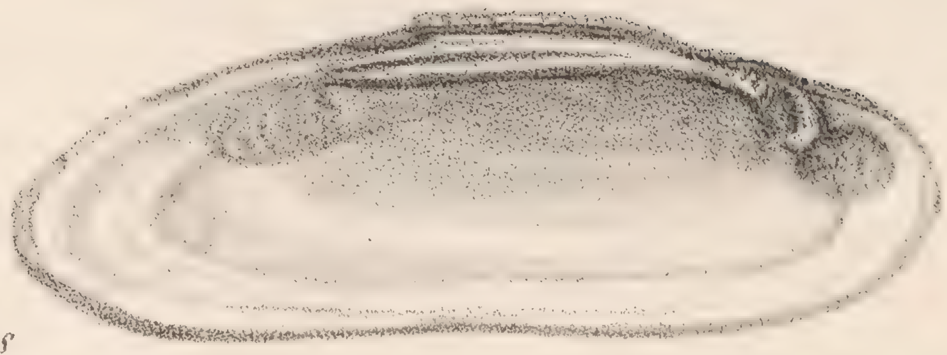












Unio carbonarius

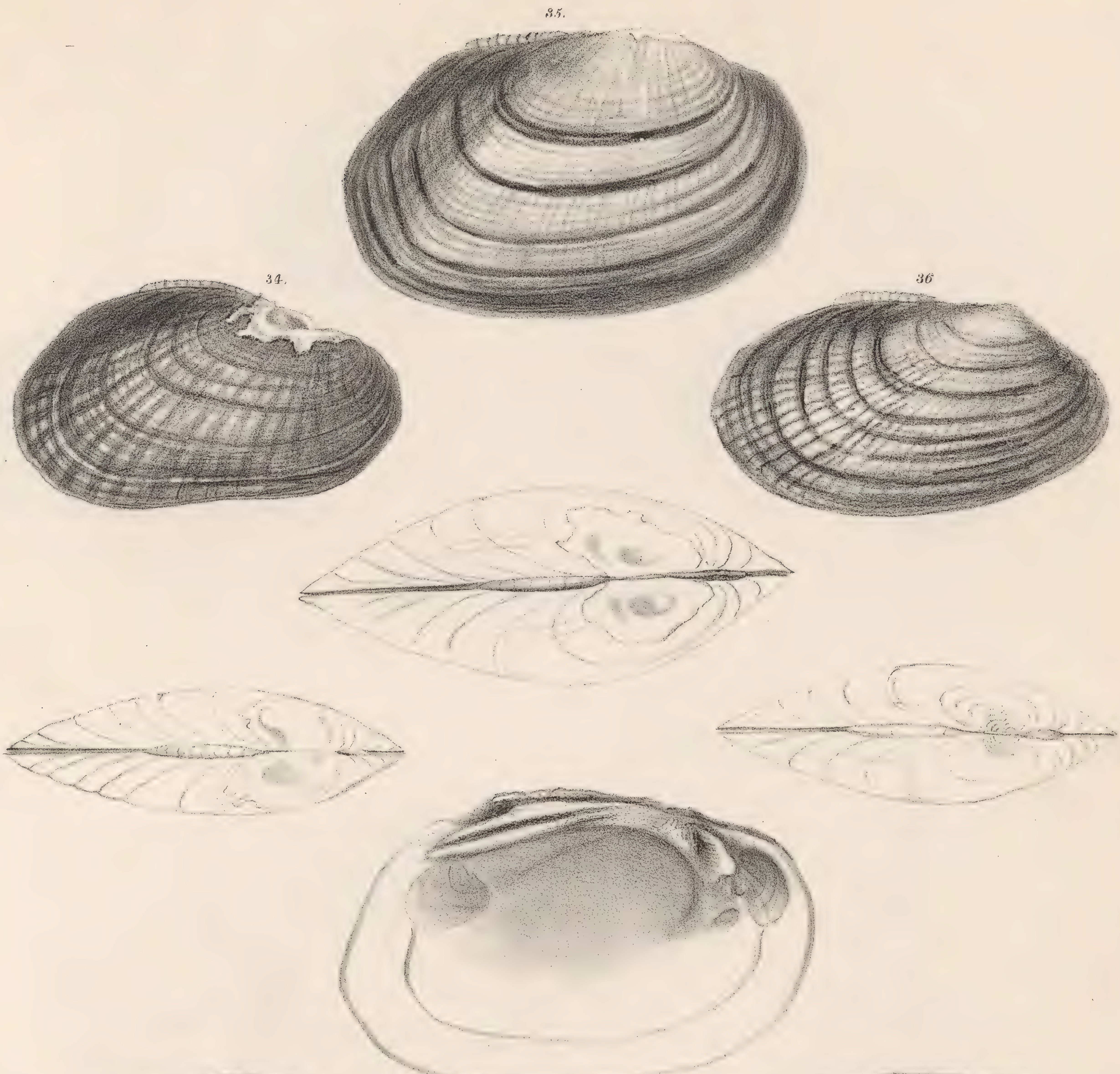
Unio Danuxensis.

Unio folliculatus.

J. Drayton del.

[illegible] Lith.

PL. XII Vol. 6.



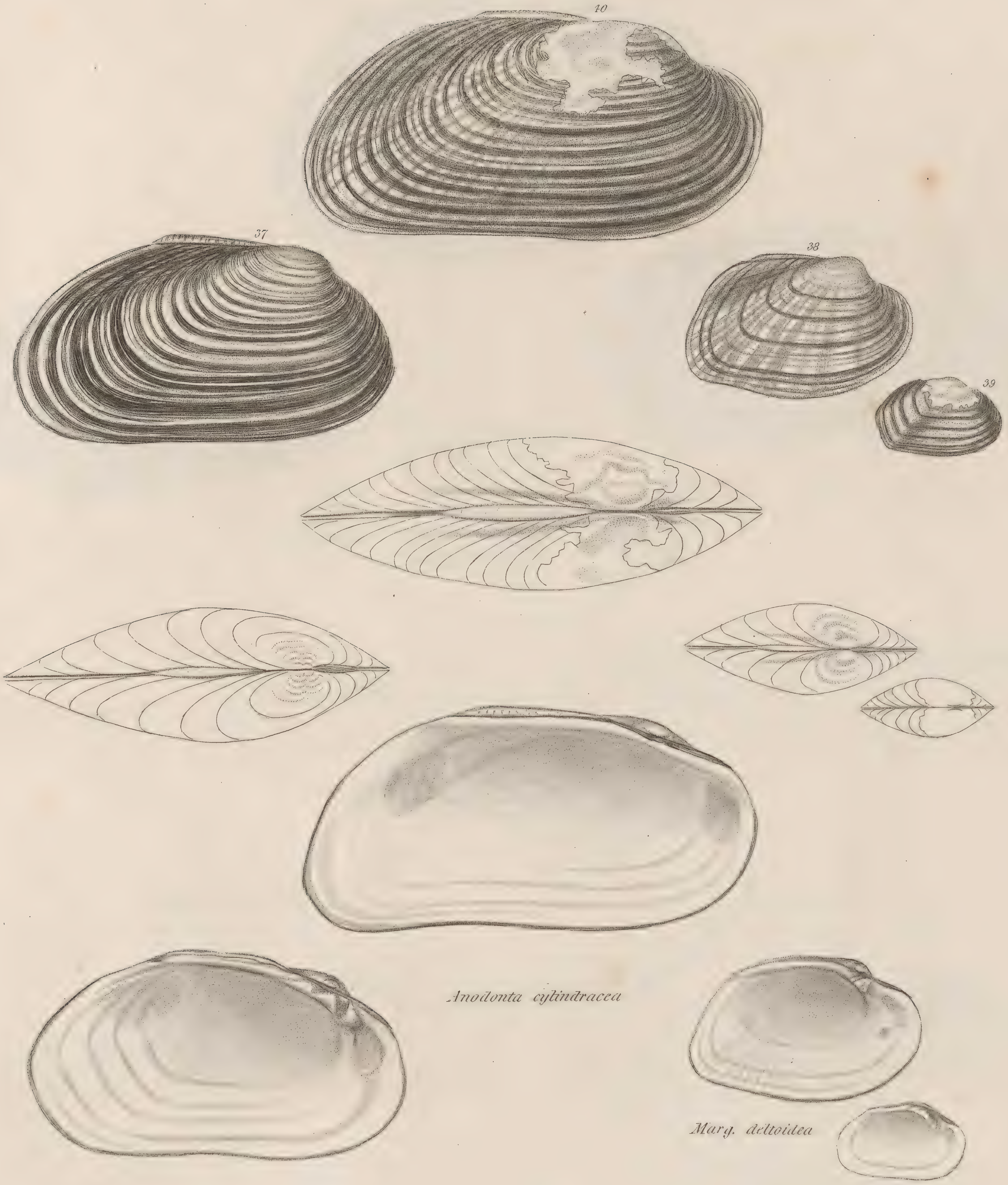
Unio Lecontianus

Unio Medellinus

Unio Muhlfeldianus

Drawn by J.Drayton.

PL. XIII Vol. 6.



Anodonta cylindracea

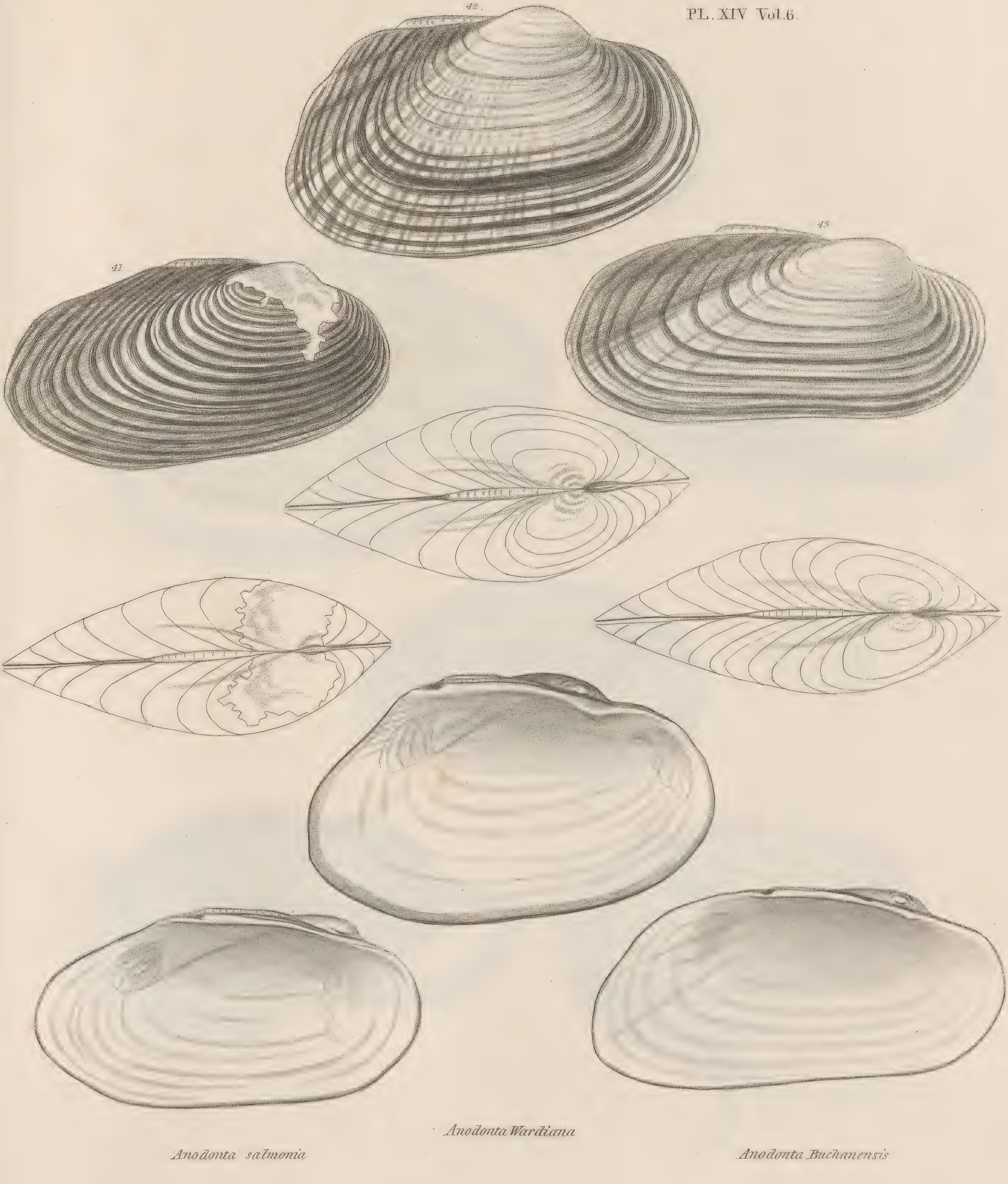
Marg. deltoidea

Margaritana Holstonia

Marg. fabula

Drawn & Engraved by J.Drayton.

PL. XIV Vol. 6.



Anodonta Wardiana

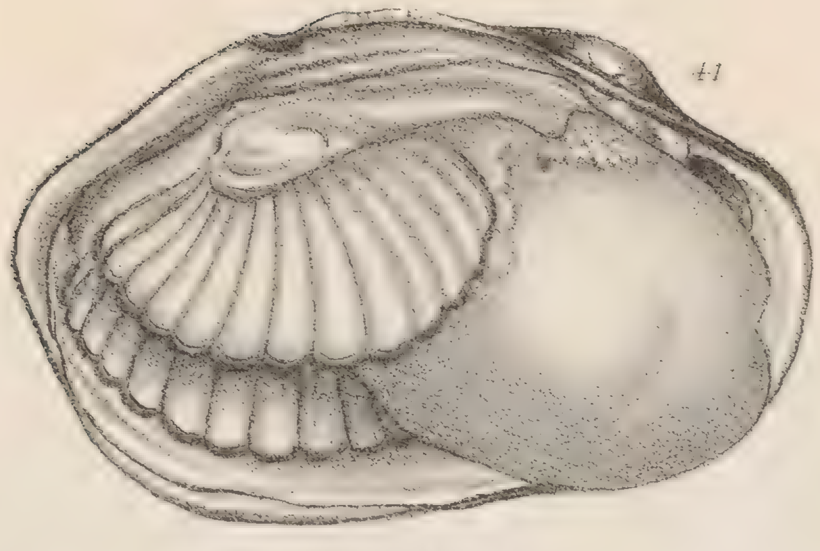
Anodonta salmonia

Anodonta Buchanensis

Drawn & Engd by J. Drayton.

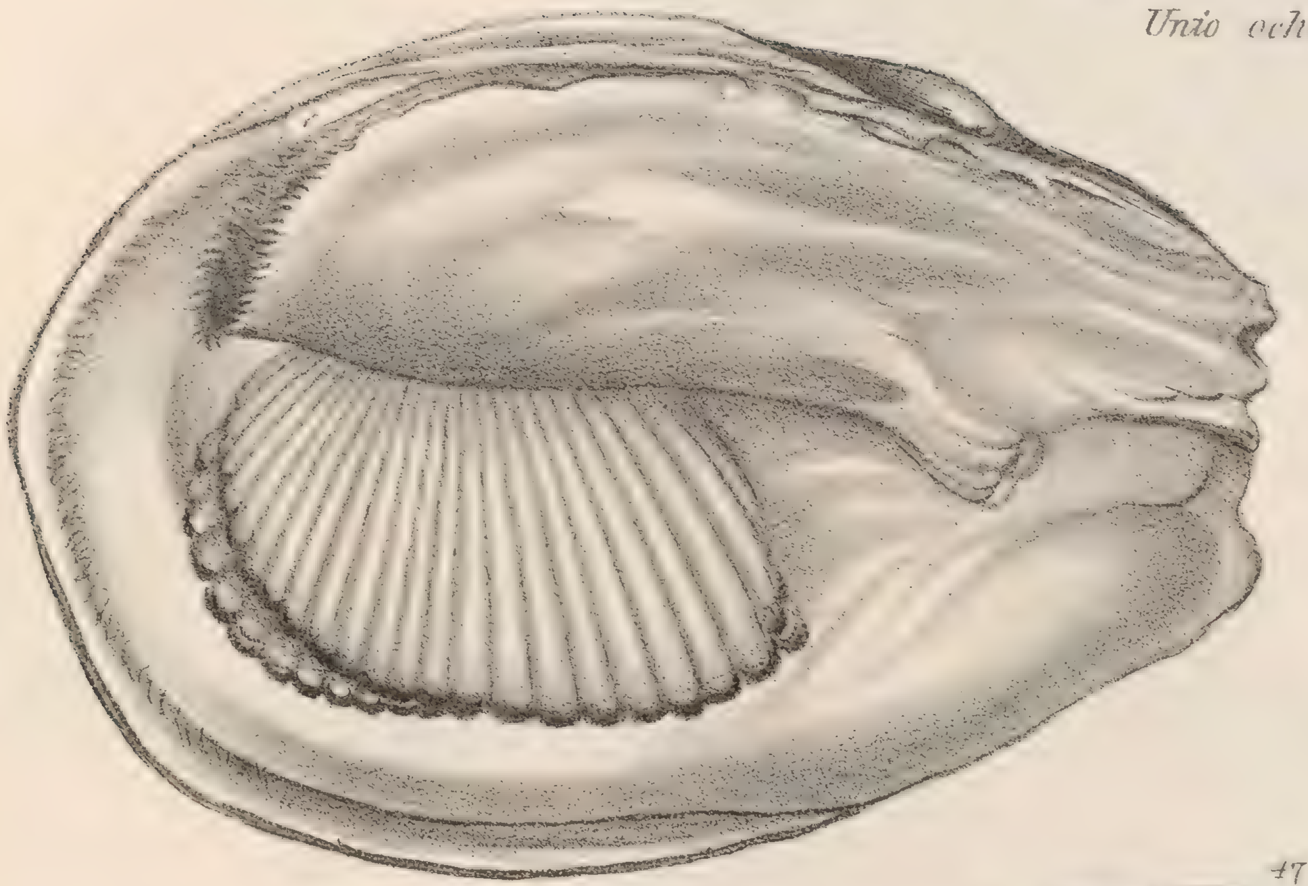
PL. XV Vol. 6.

44



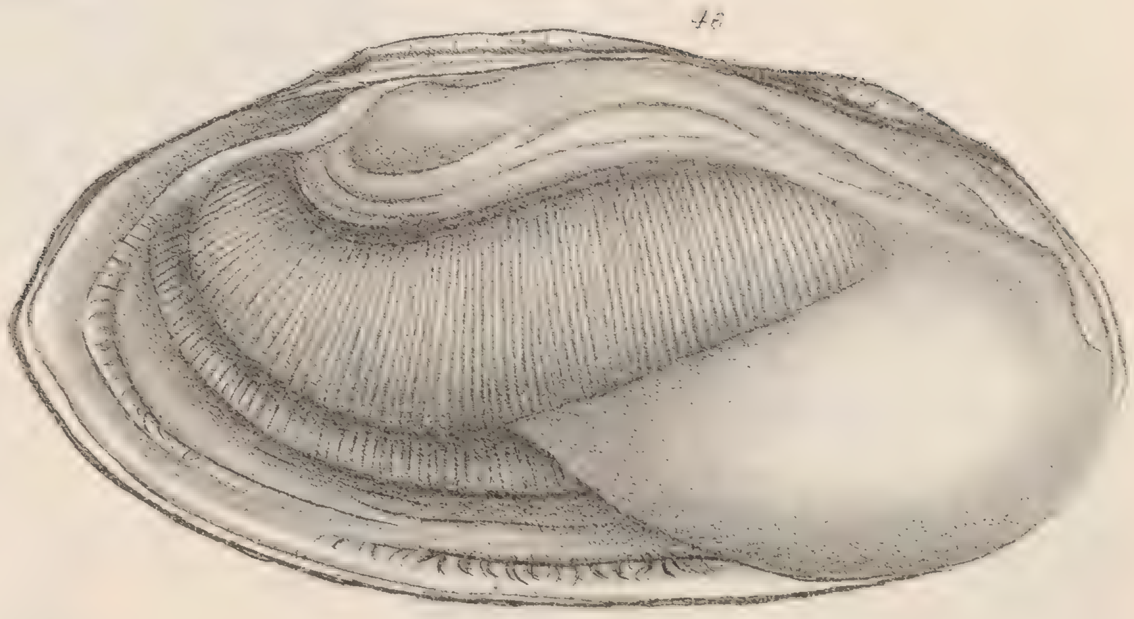
Unio ochraceus

45



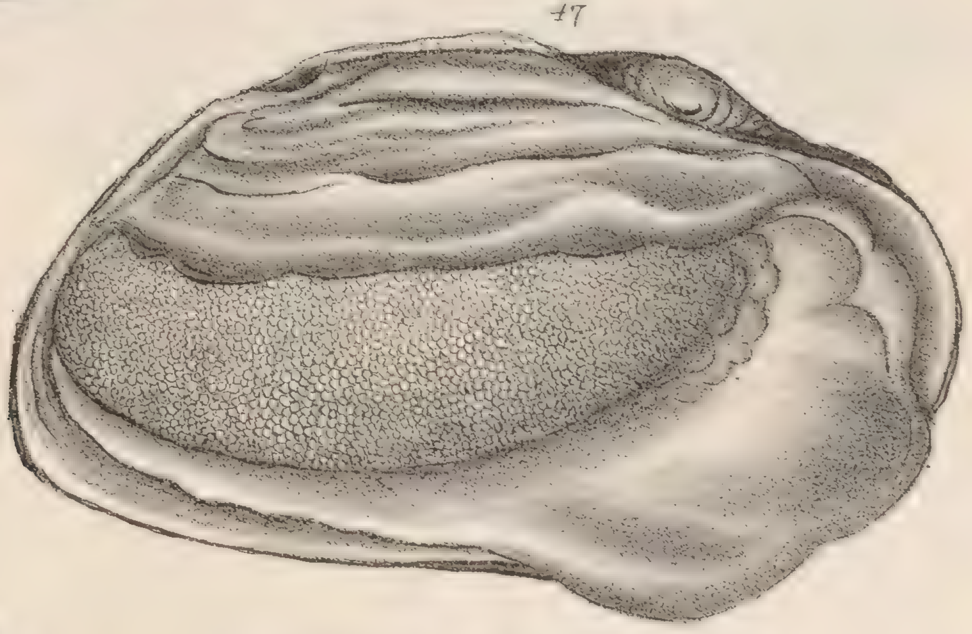
Unio cariosus

46

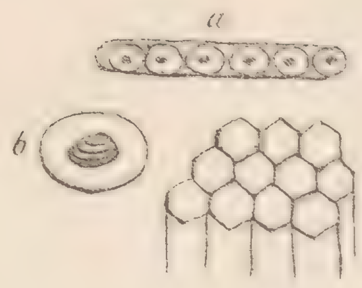


Anodonta fluviatilis

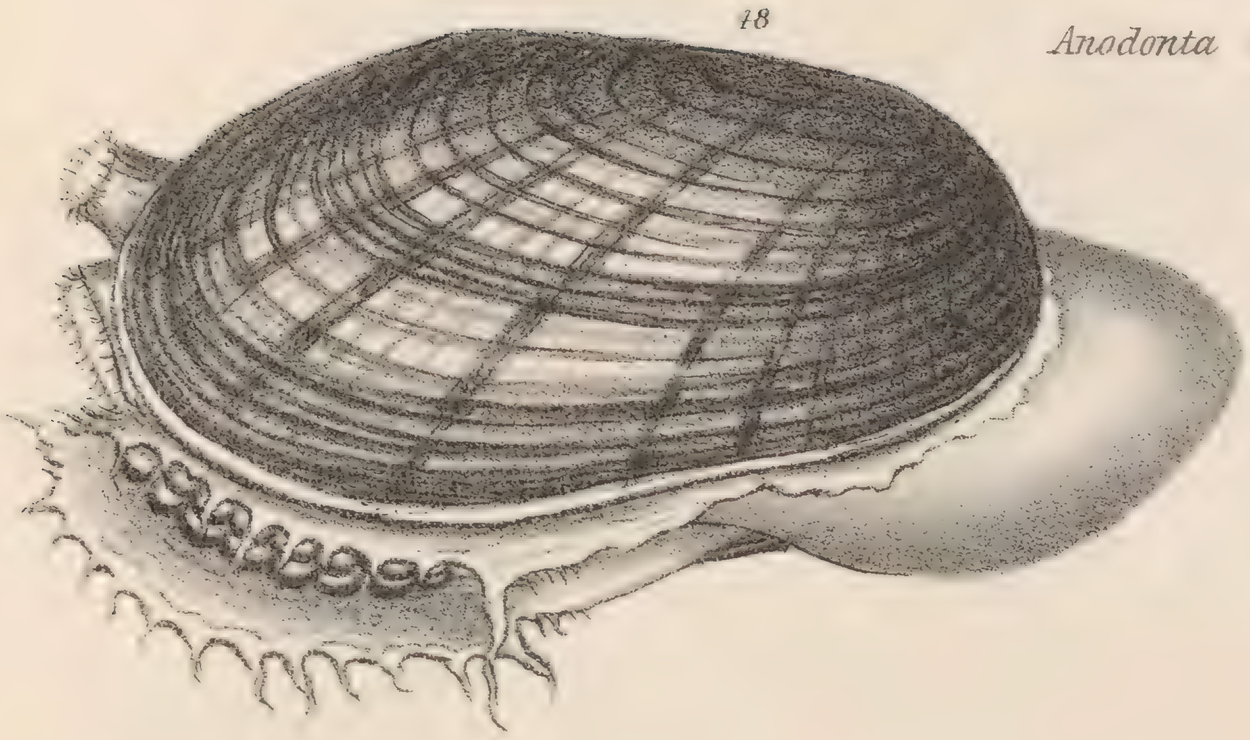
47



Anodonta undulata

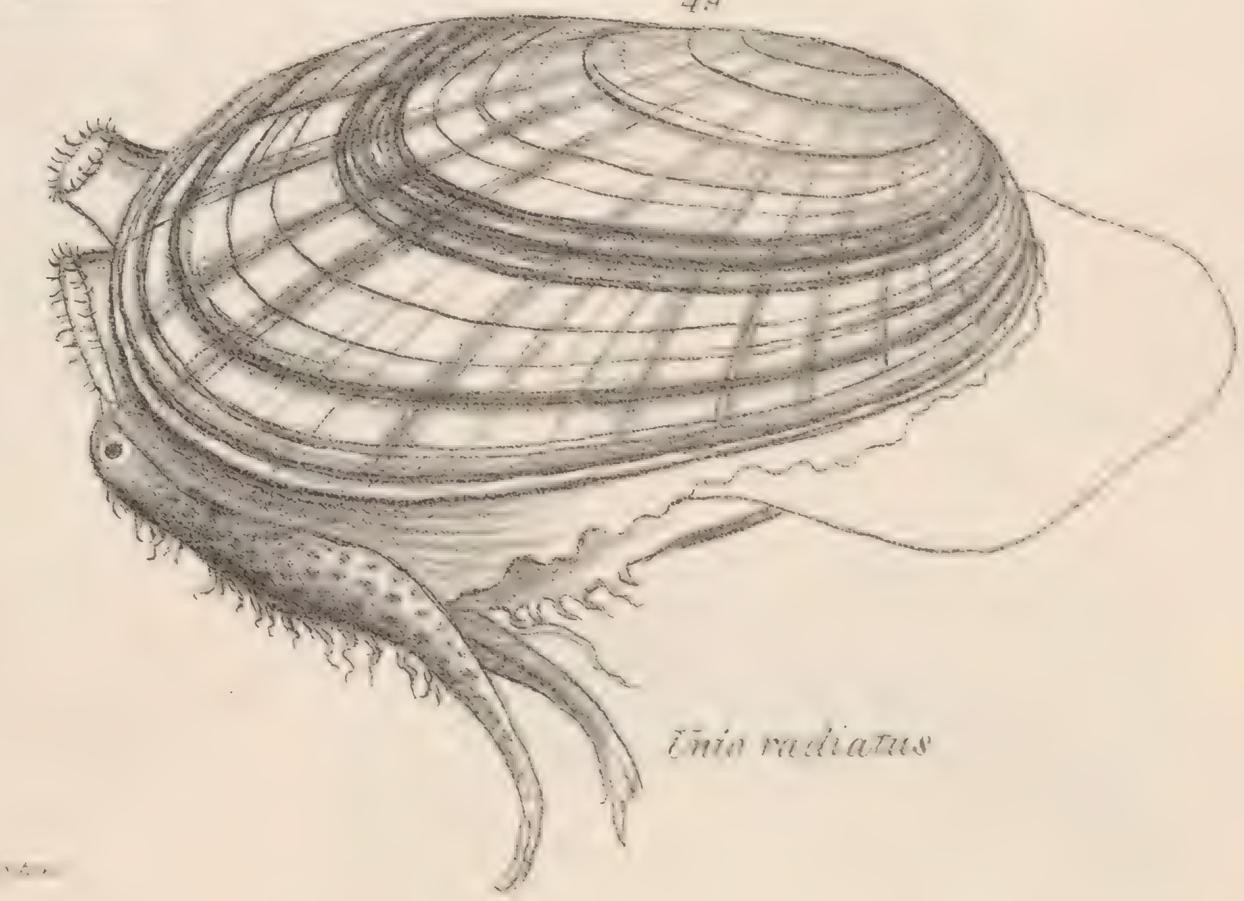


48



Unio radiatus

49

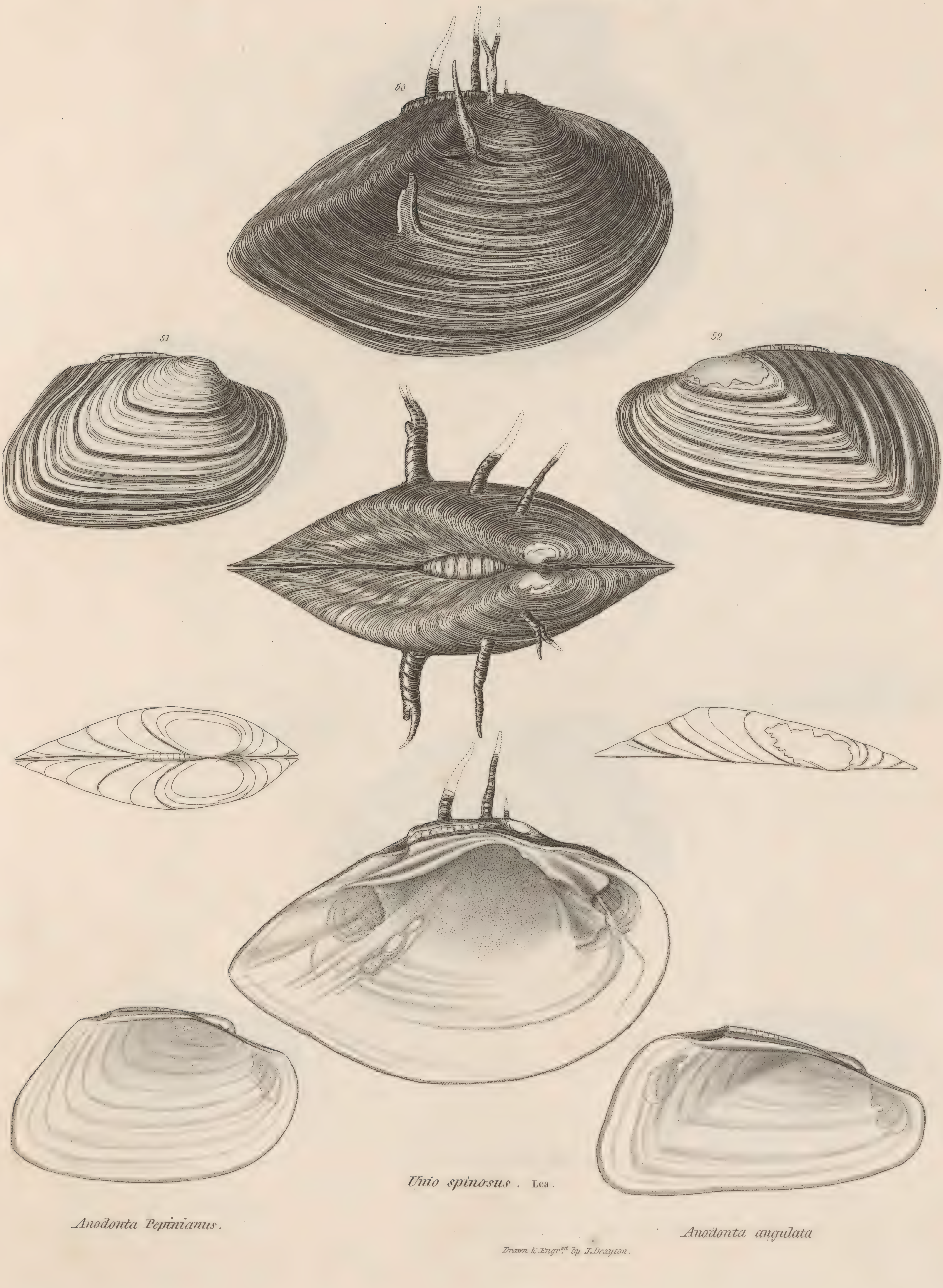


Unio radiatus

Drawn & on stone by J. [illegible]

[illegible]

PL. XVI Vol. 6.



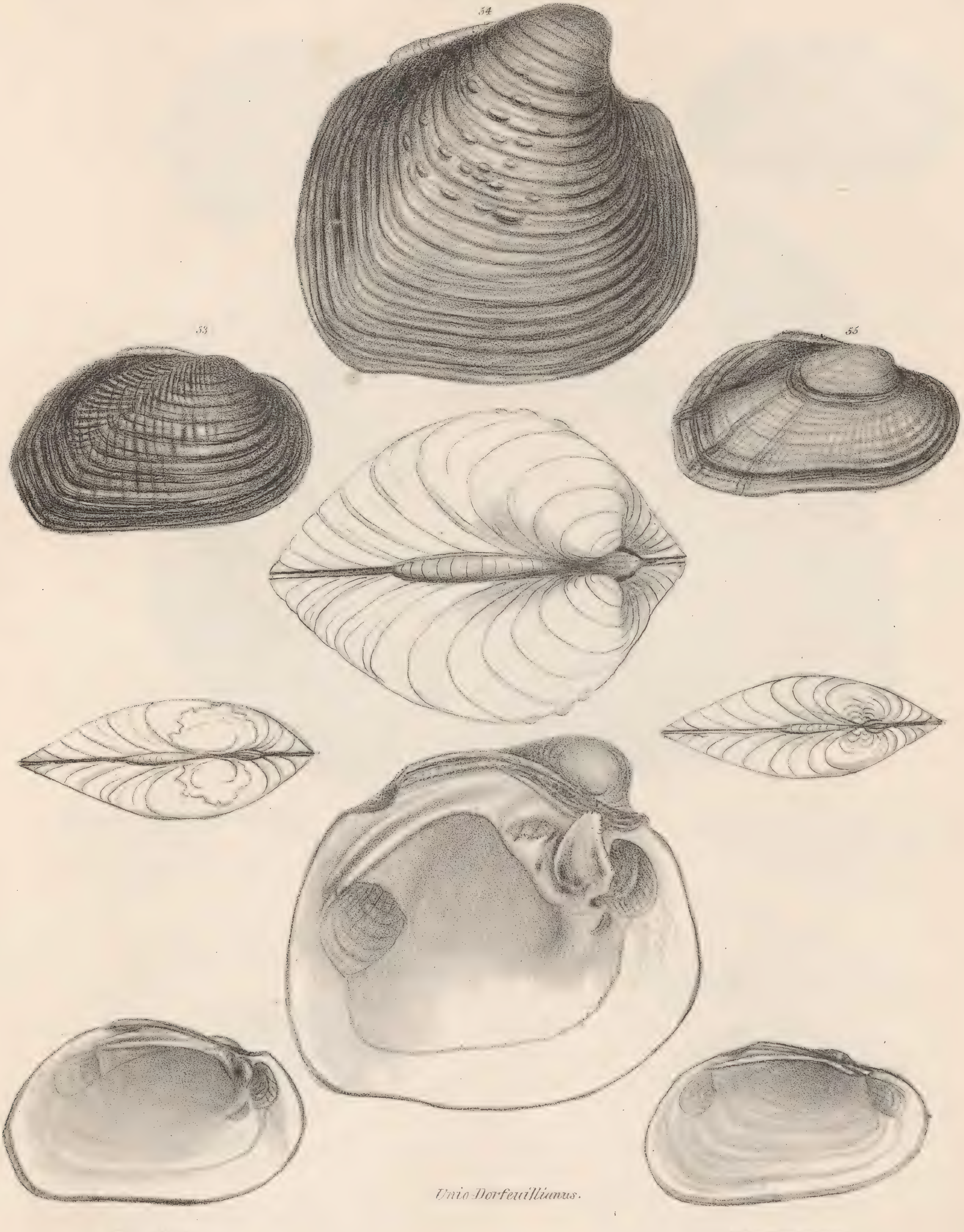
Unio spinosus. Lea.

Anodonta Pepinianus.

Anodonta angulata

Drawn & Engrd. by J. Drayton.

PL. XVII Vol. 6.



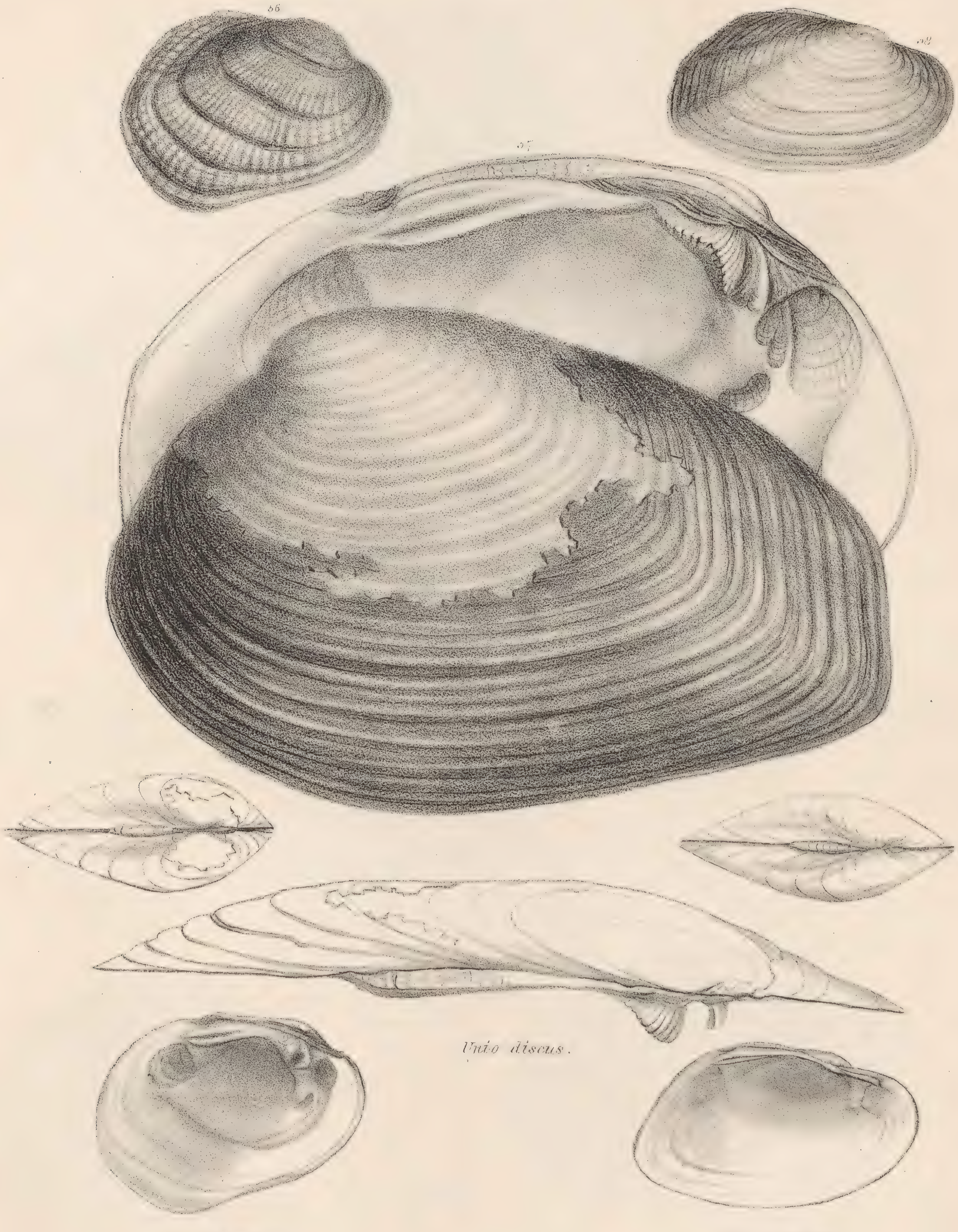
Unio Dorfeuillianus.

Unio pliciferus.

Unio Tappanianus.

Drawn by J. Drayton.

PL. XVIII Vol. 6.

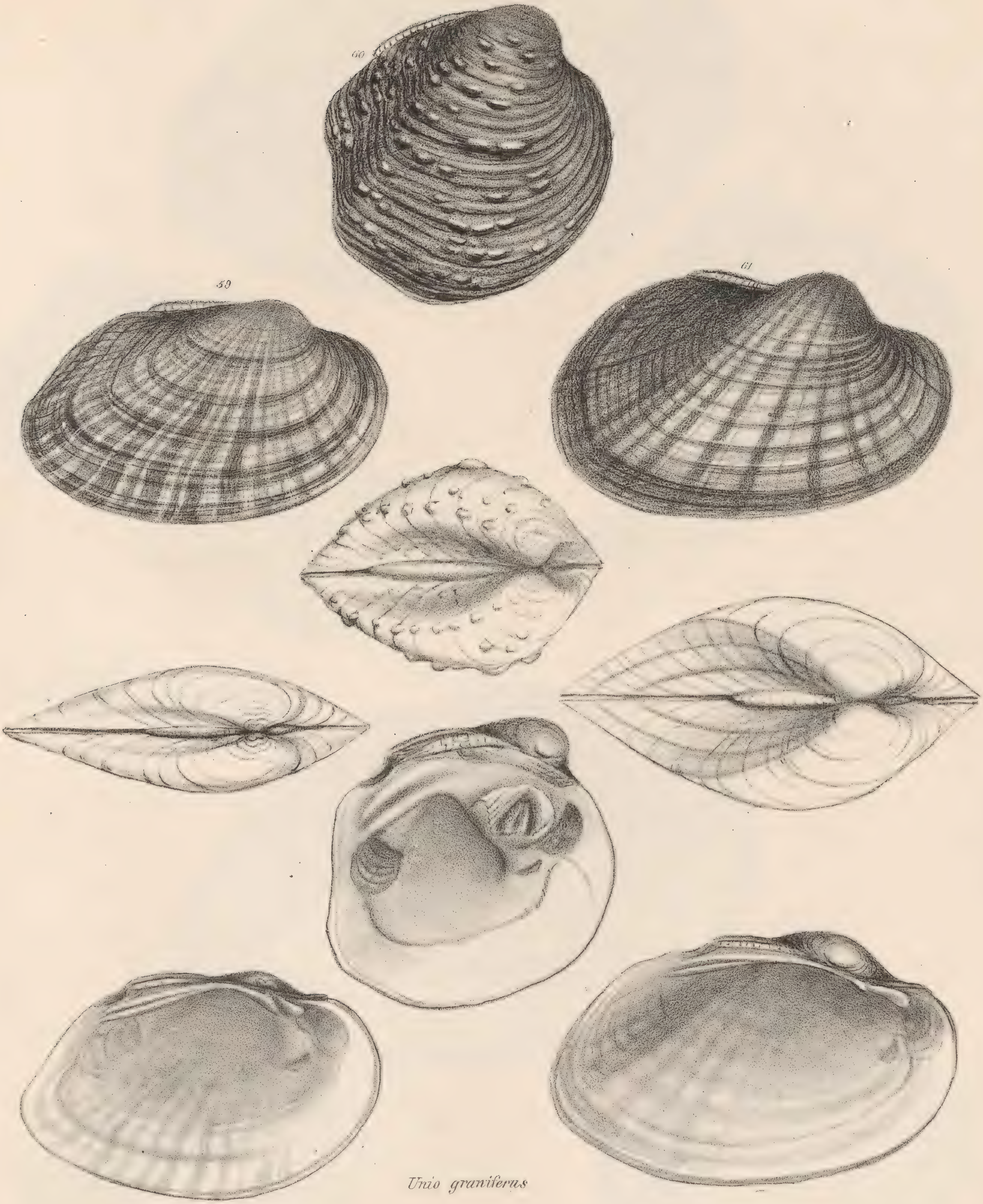


Unio discus.

Unio Rangianus.

Unio contradens.

Drawn &c. by J. Drayton.



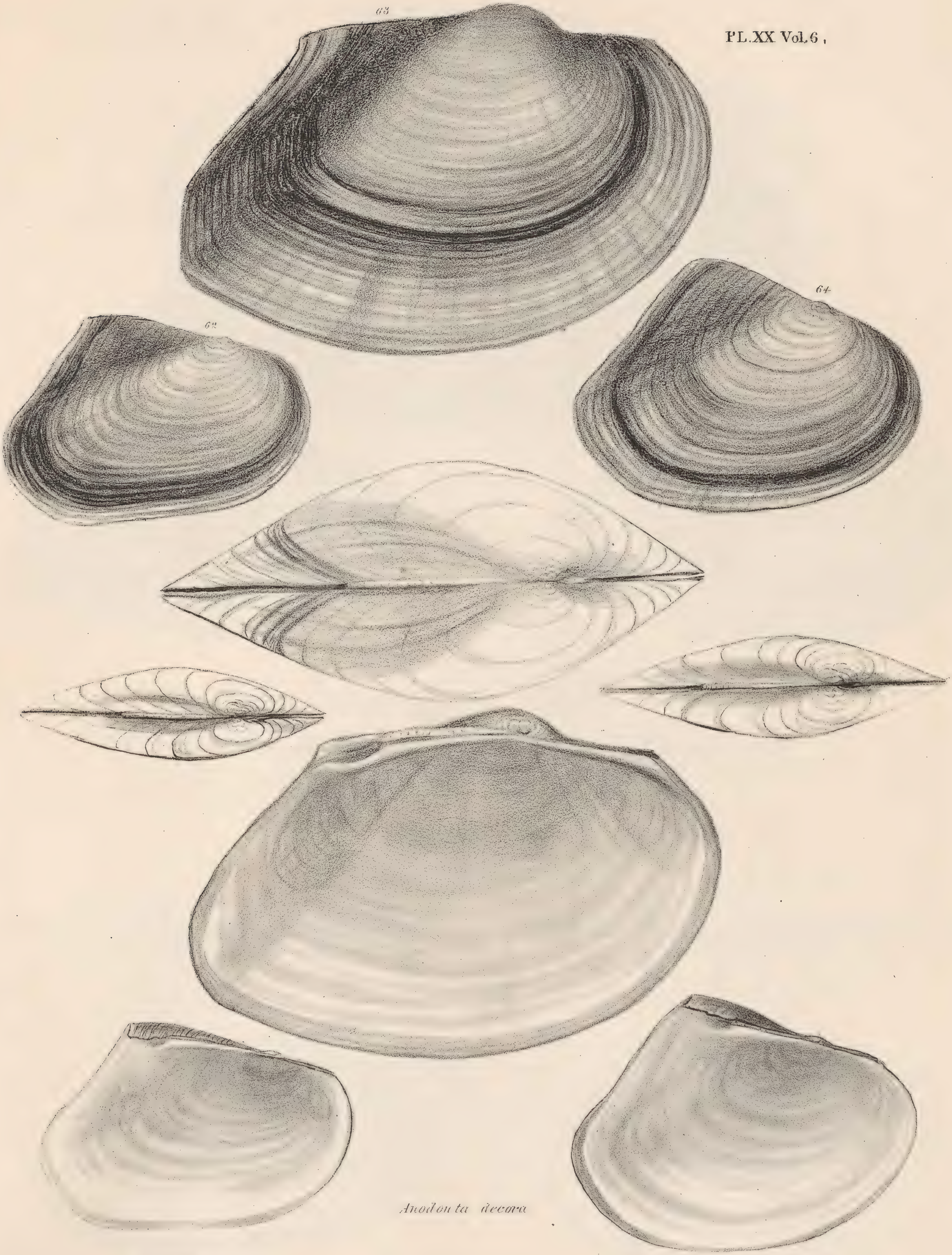
Unio graniferus

Unio Menkianus

Unio splendidus

Drawn &c by J. Drayton

PL. XX Vol. 6.



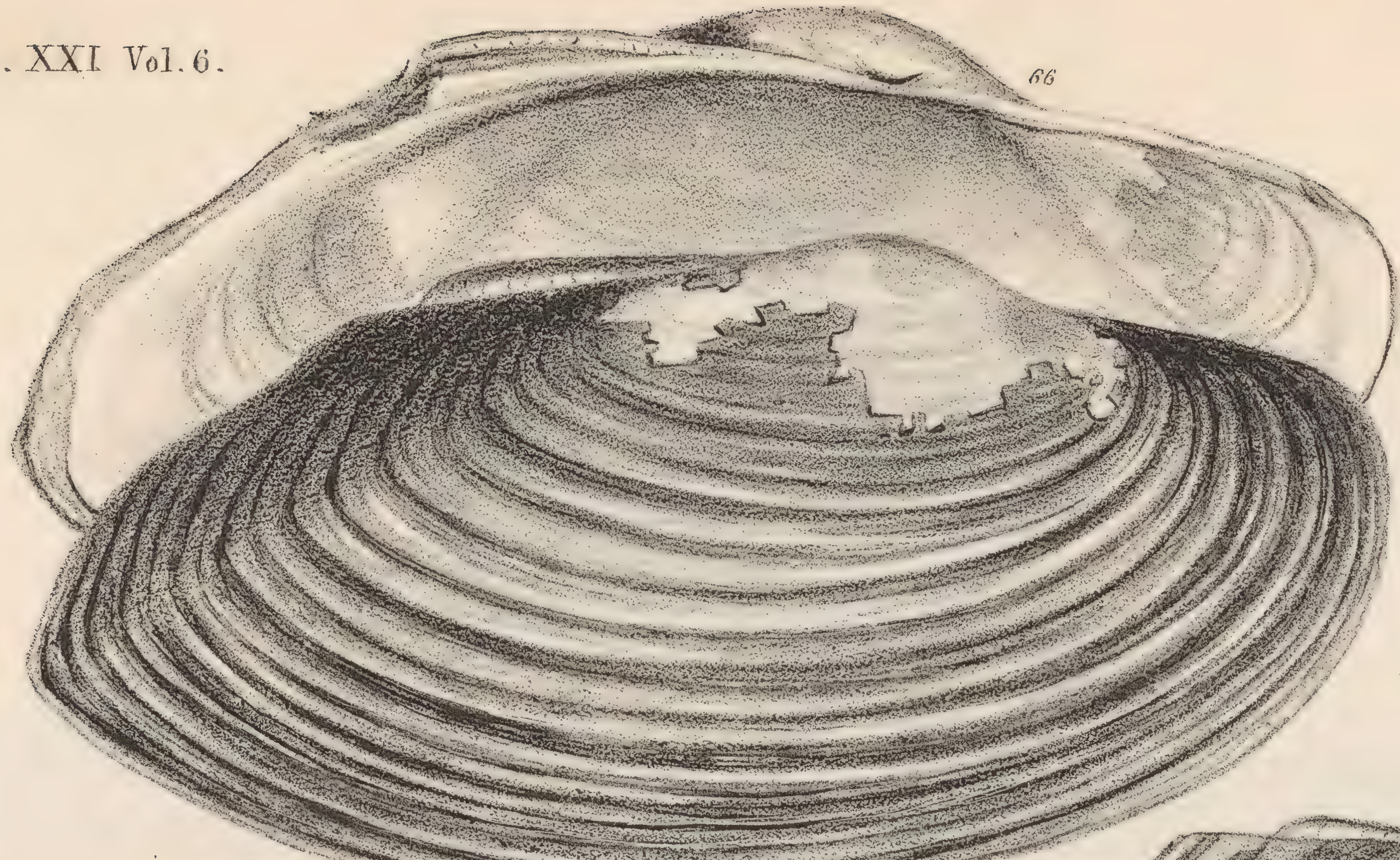
Anodonta decora

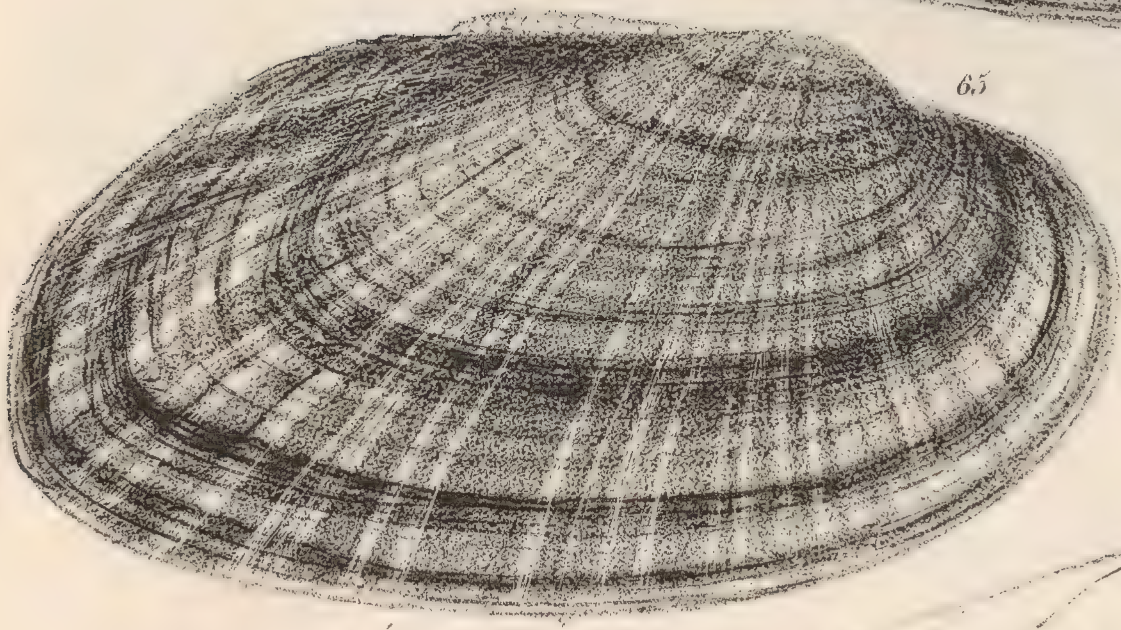
Anodonta Nuttalliana

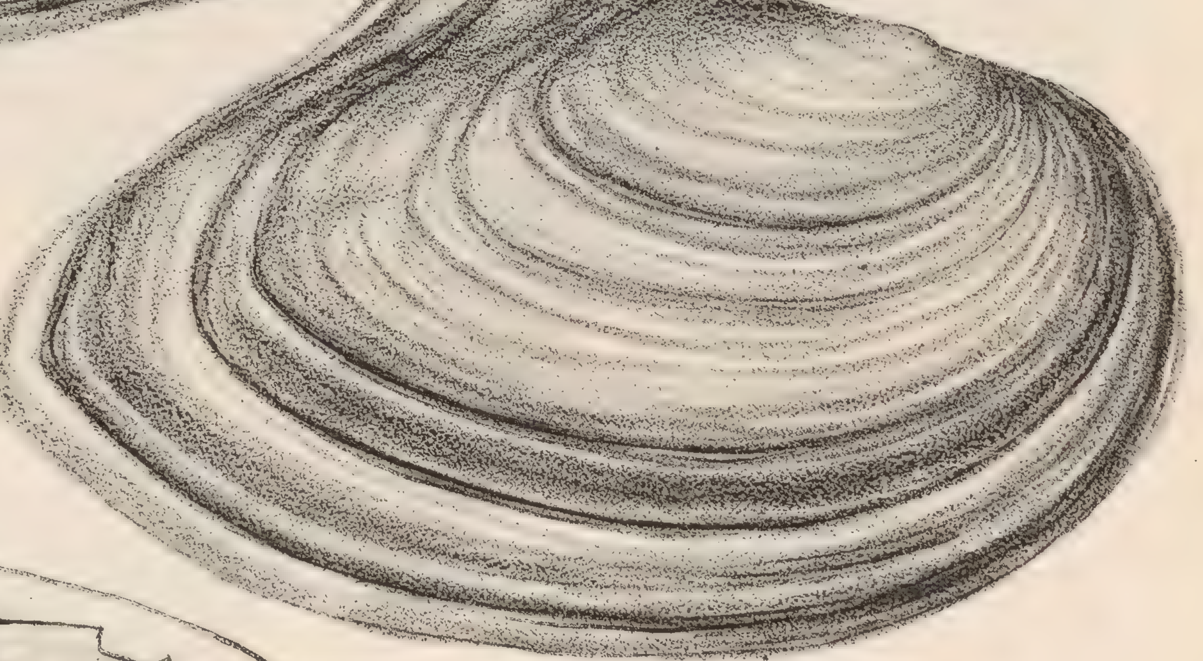
Anodonta Wahlamatensis

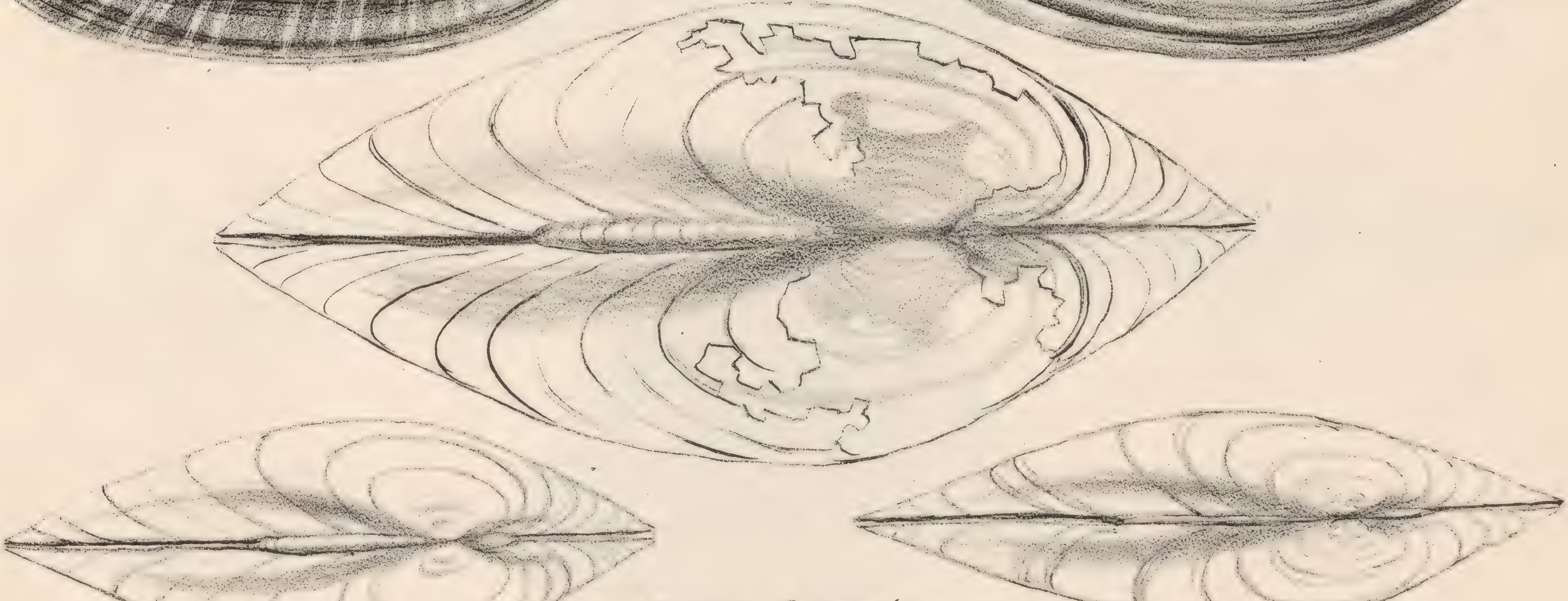
Drawn by J. Drayton

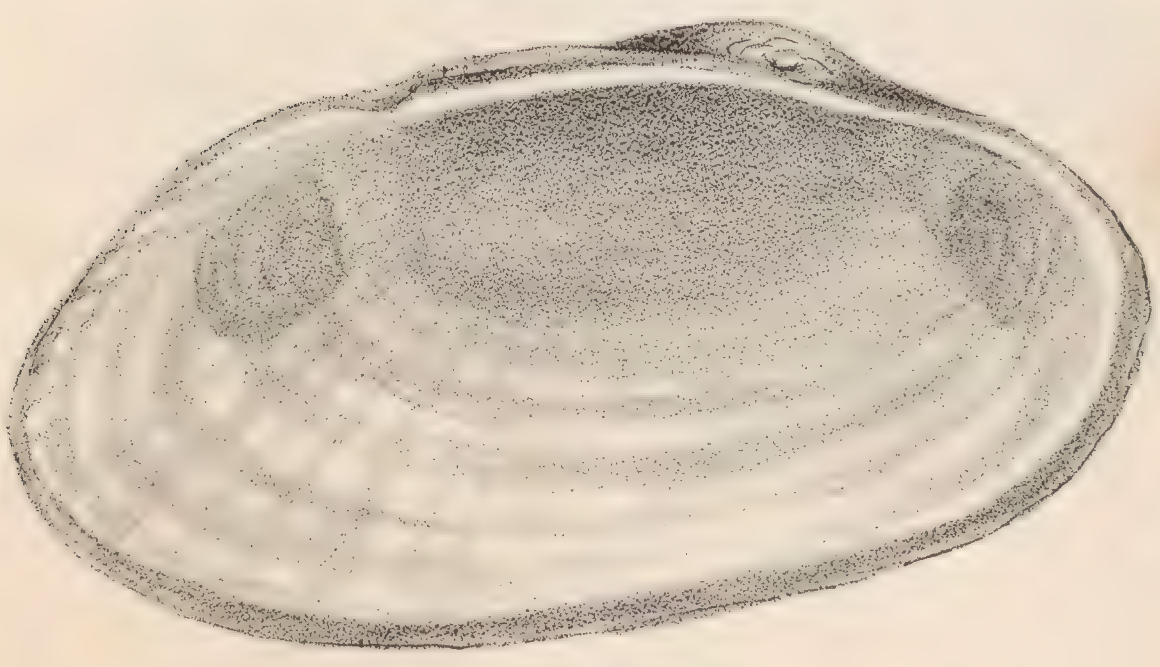
PL. XXI Vol. 6.

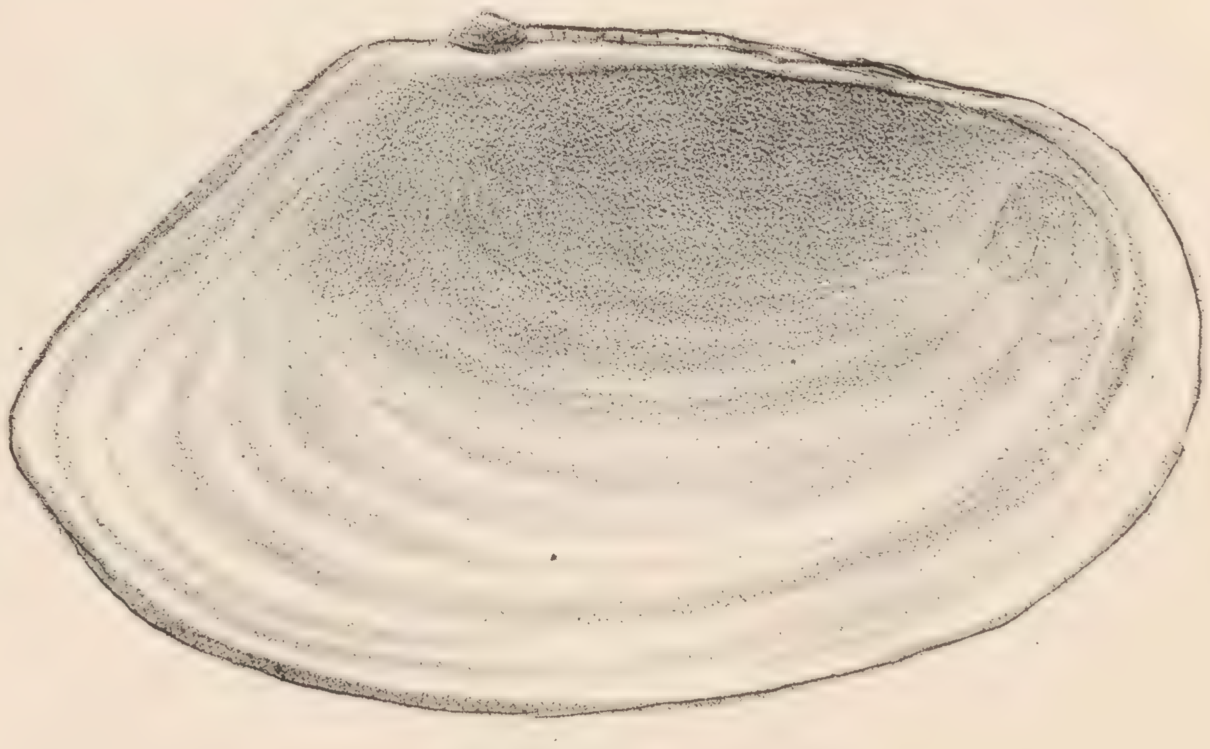

66


65

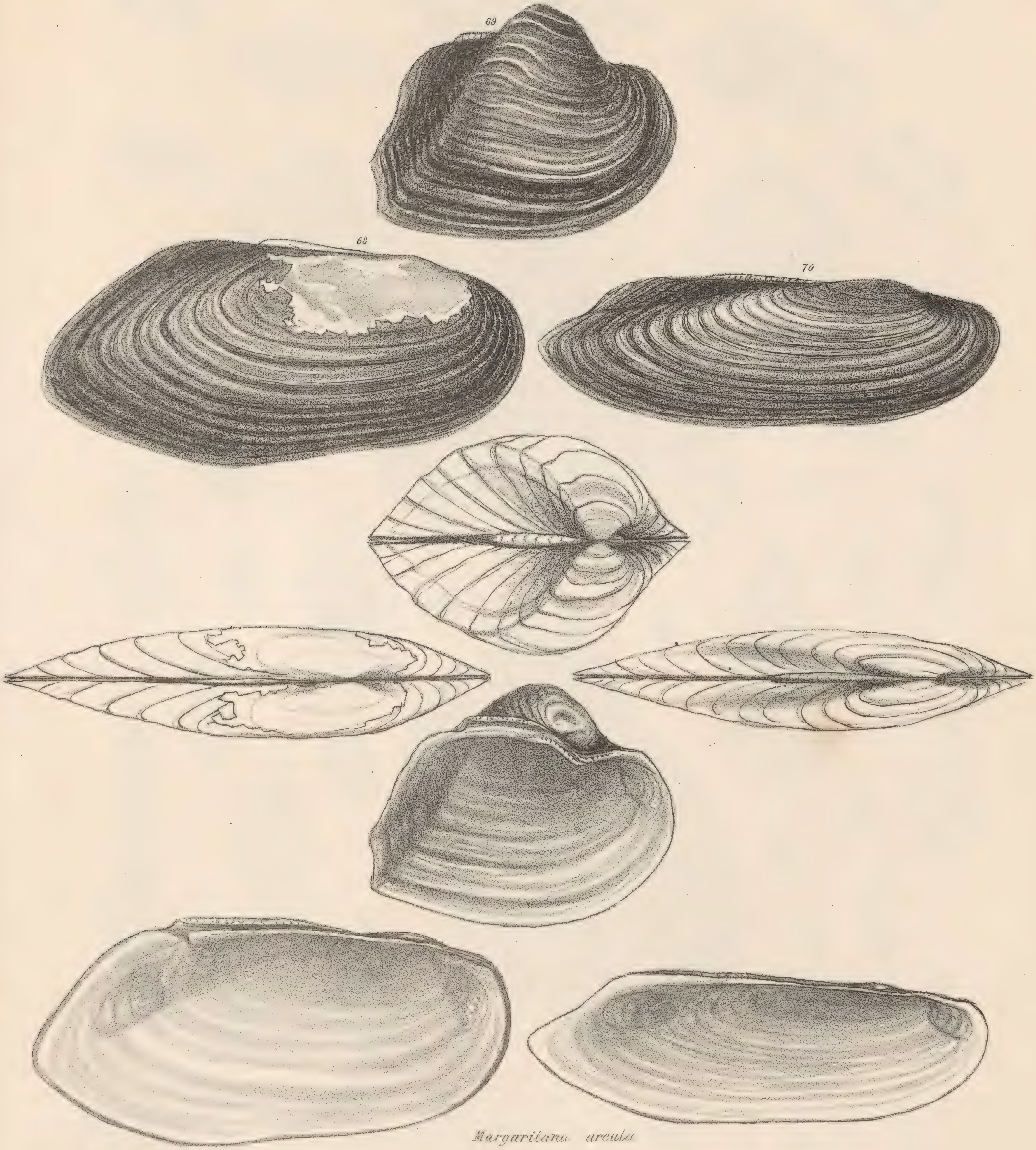

67


Anodonta Newtonensis


Anodonta pavonia


Anodonta Oregonensis

Drawn by J. Drayton



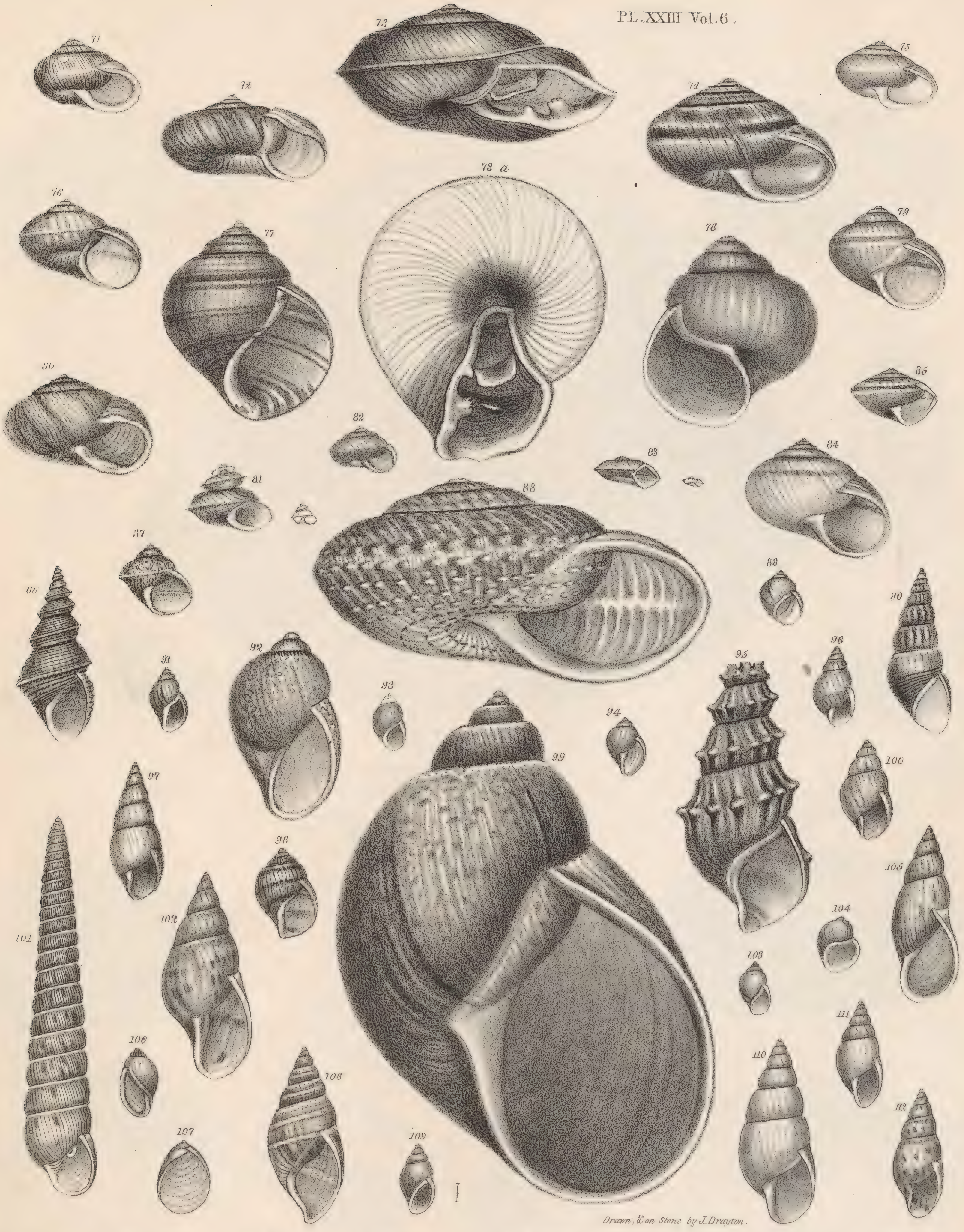
Margaritana arcula

Anodonta exilis

Iridina cœlestis

Drawn by J Drayton

PL. XXIII Vol. 6.



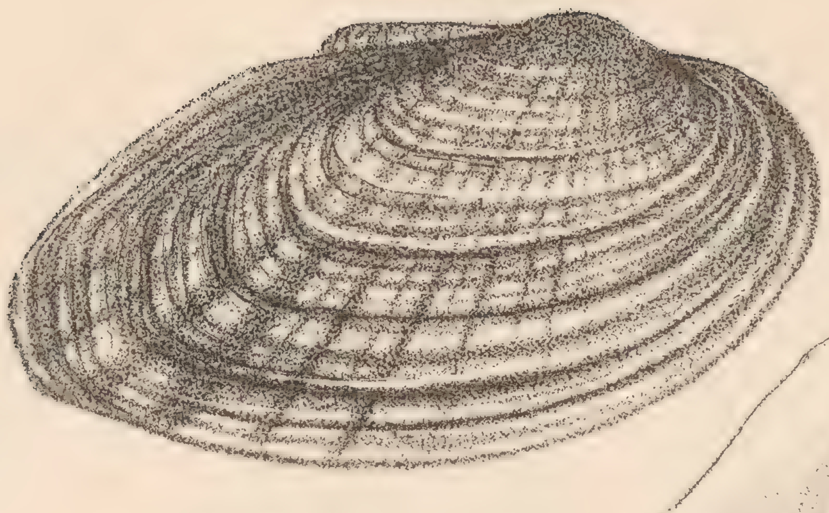
Drawn, & on Stone by J. Drayton.

71	Helix	Mitchelliana
72	„	Vancouverensis
73	Carocolla	Hydiana
74	Helix	Nuttalliana
75	„	Columbiana
76	Cyclostoma	Popayana
77	Ampullaria	Pealiana
78	Paludina	Sinistrosa
79	Helix	Californensis
80	„	Townsendiana
81	Paludina	hyalina
82	Helix	Wardiana
83	Planorbis	lens
84	Helix	Nickliniana
85	„	Oregonensis
86	Melania	Troostiana
87	Cyclostoma	maculata
88	Helix	magnifica
89	Paludina	Nuttalliana
90	Melania	plicifera
91	Lymniea	solida
92	Bulimus	glandiformis
93	Paludina	virens
94	Lymniea	apacina
95	Melania	plicata
96	Bulimus	parvus
97	„	virgo
98	Melania	inflata
99	Bulimus	Gibbonius
100	„	lacteus
101	Megaspira	Ruschenbergiana
102	Bulimus	gracilis
103	Paludina	nuclea
104	Paludina	pallida
105	Bulimus	Pealianus
106	Physa	aurea
107	Succinea	aperta
108	Bulimus	decoratus
109	Paludina	Nickliniana
110	Bulimus	Columbianus
111	„	corneus
112	„	maculatus

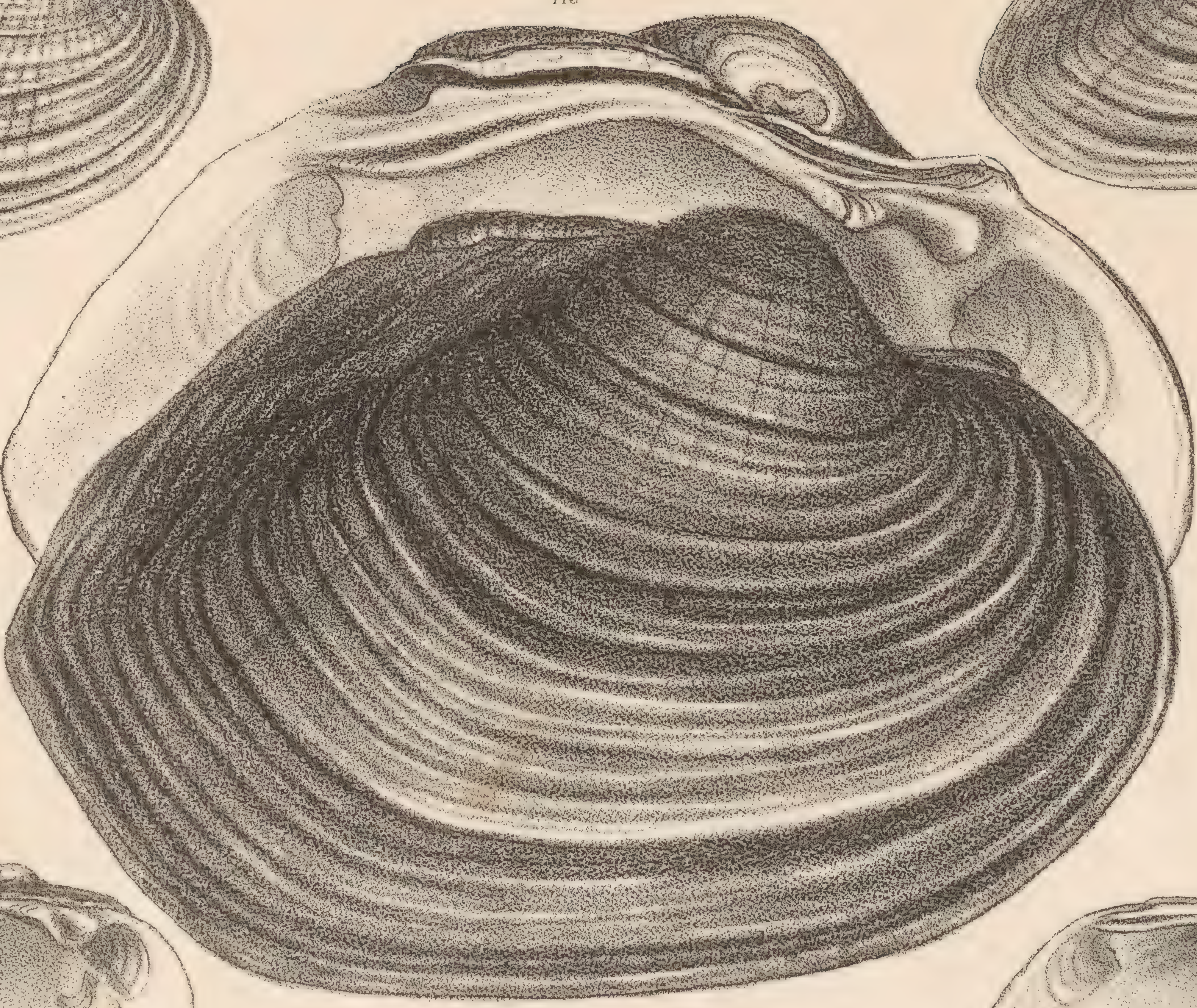
[illegible]

PL. XXIV Vol. 6.

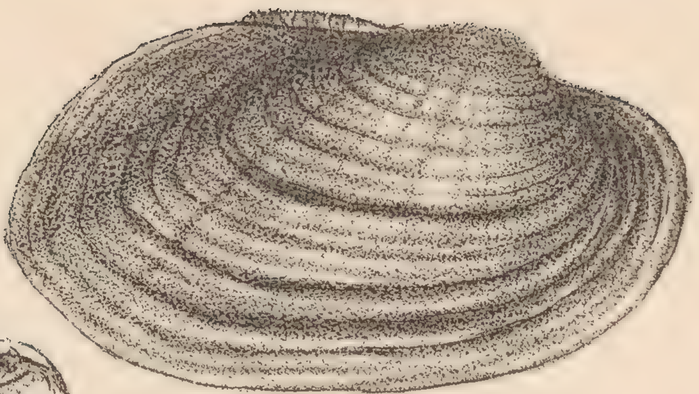
114

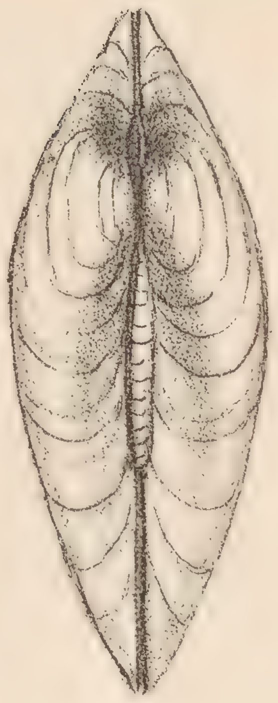


113

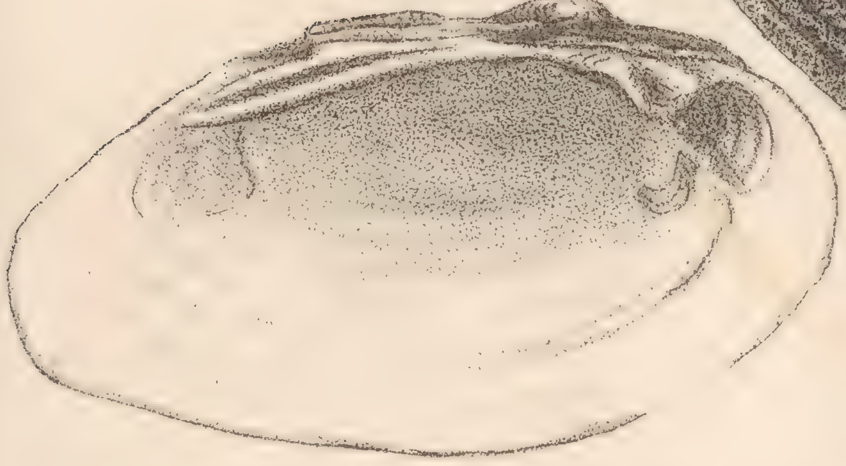


115

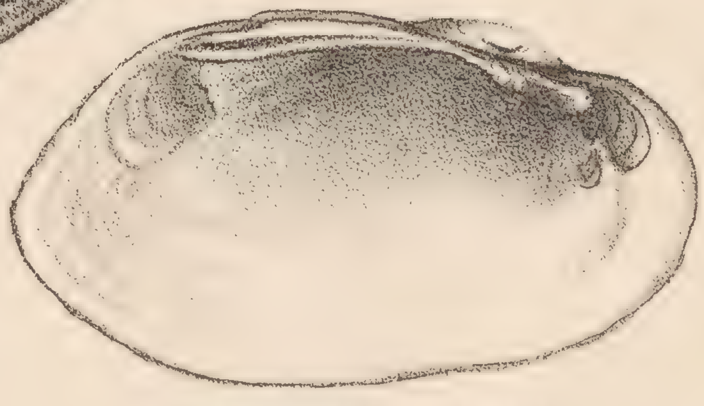




Unio dolabræformis.

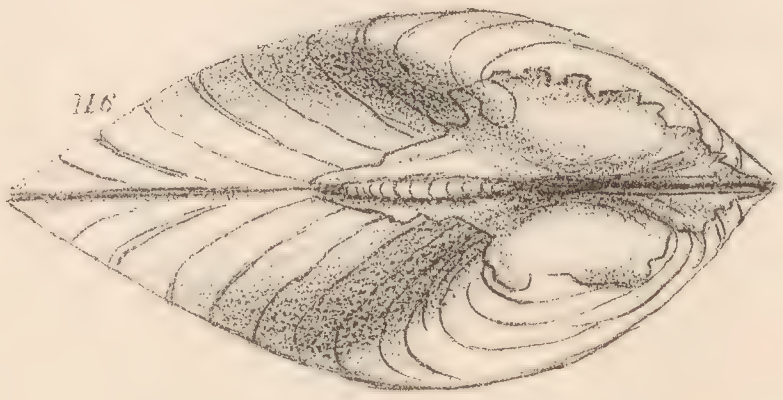


Unio Novi-Eboraci.

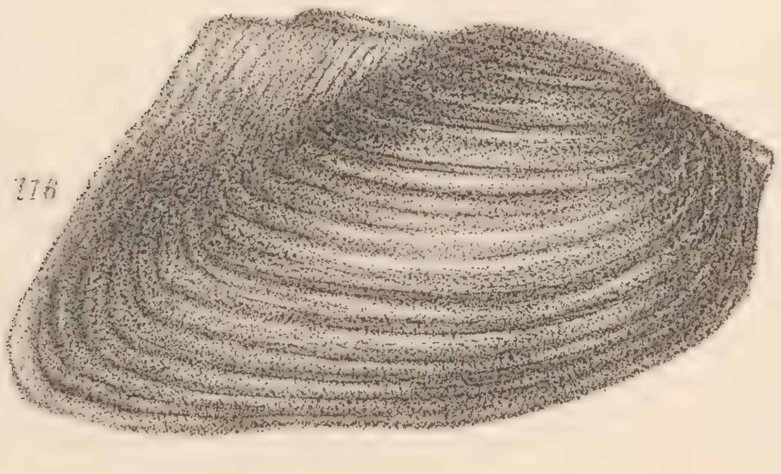


Unio Claibornensis.

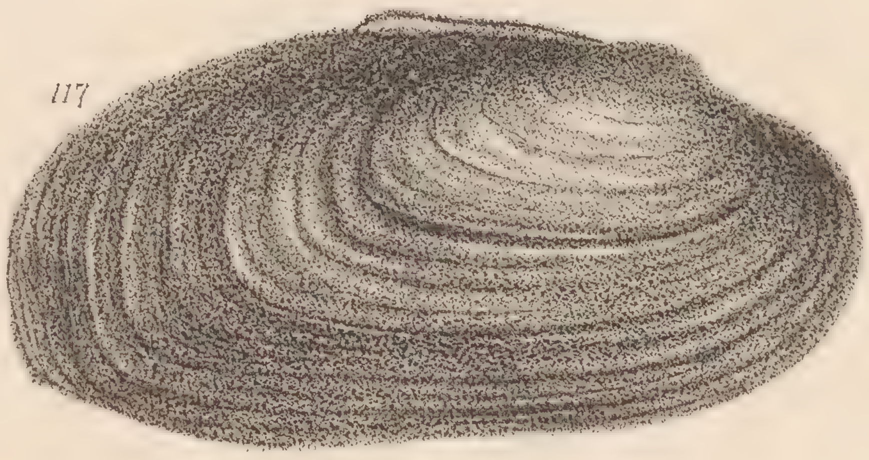
116



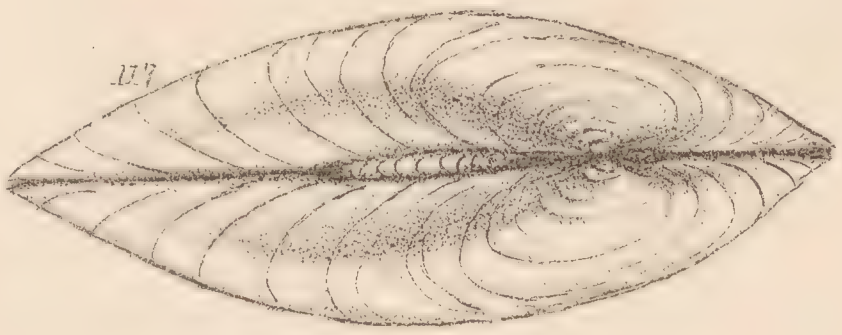
116

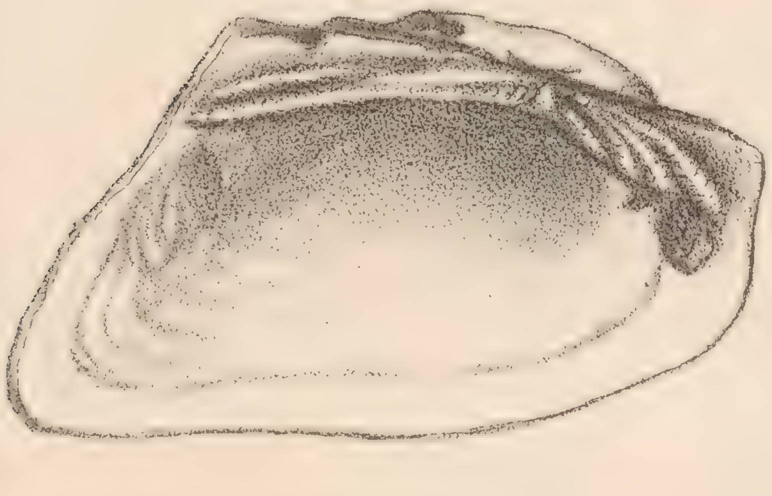


117

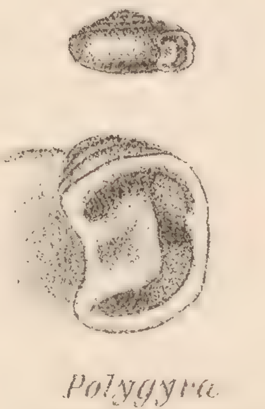


117

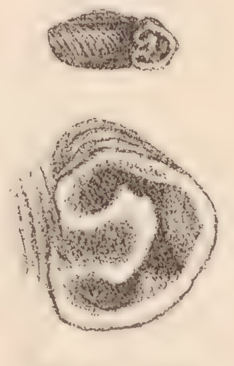


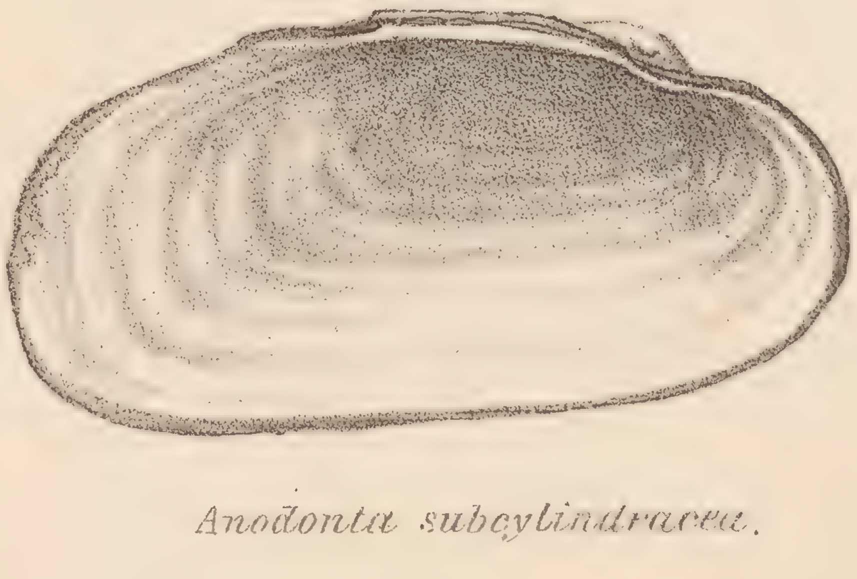


118



119





Unio Brownianus.

Polygyra Dorfeuilliana.

Polygyra Troostiana.

Anodonta subcylindracea.

Drawn by J. Drayton.

1
32 1681.⑤

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 00573 1294